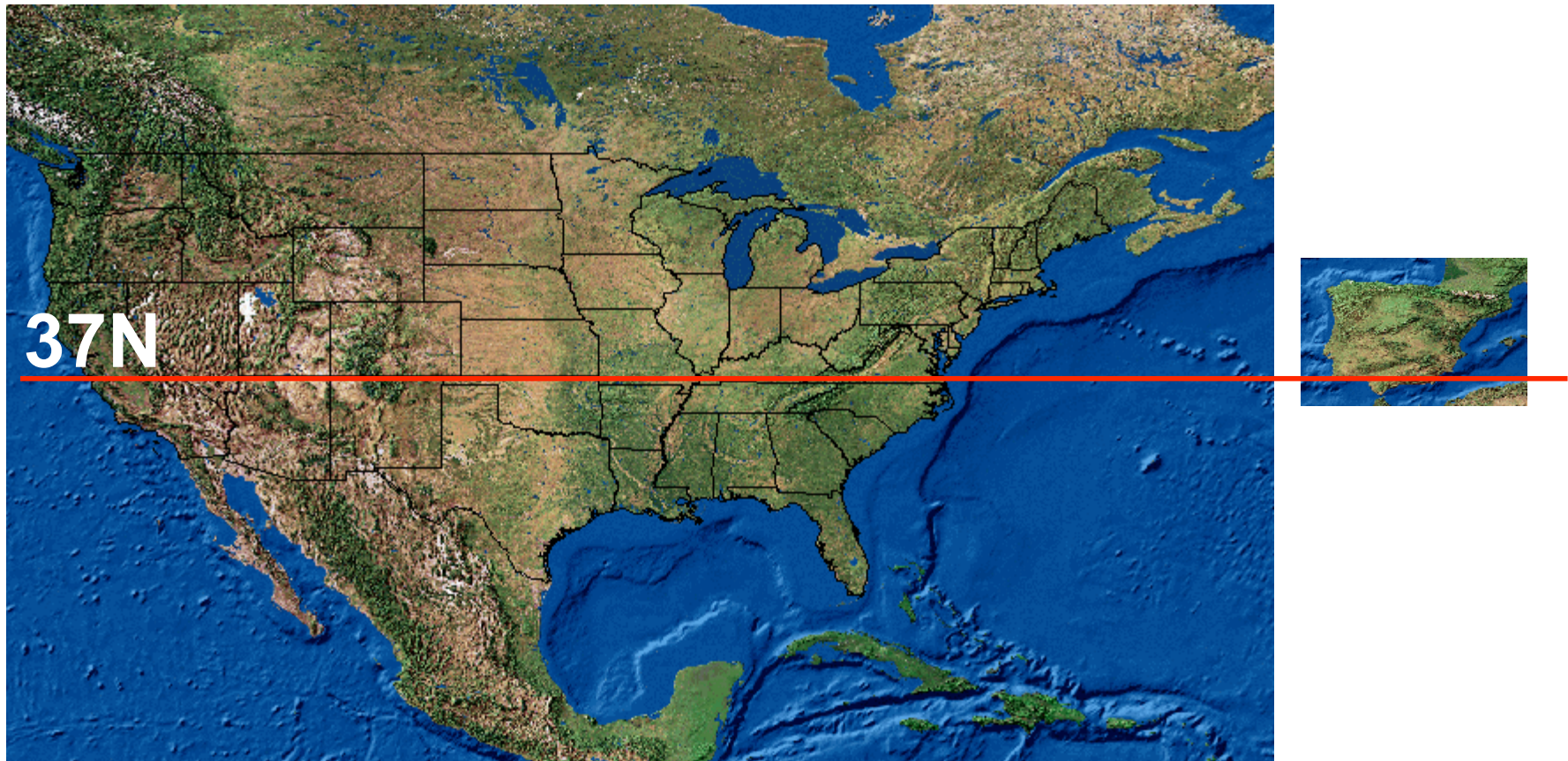


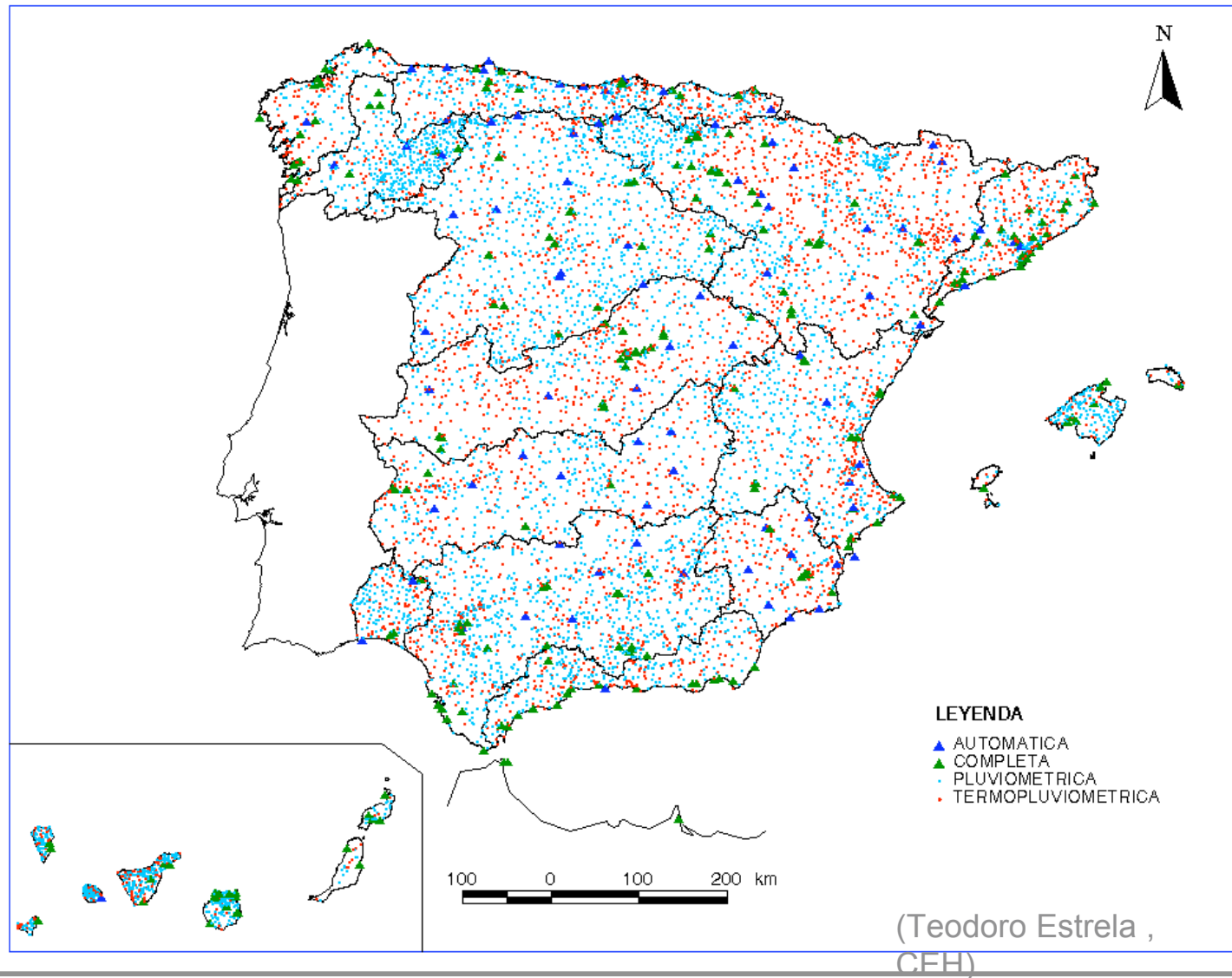
GPM-Related Activities in Spain

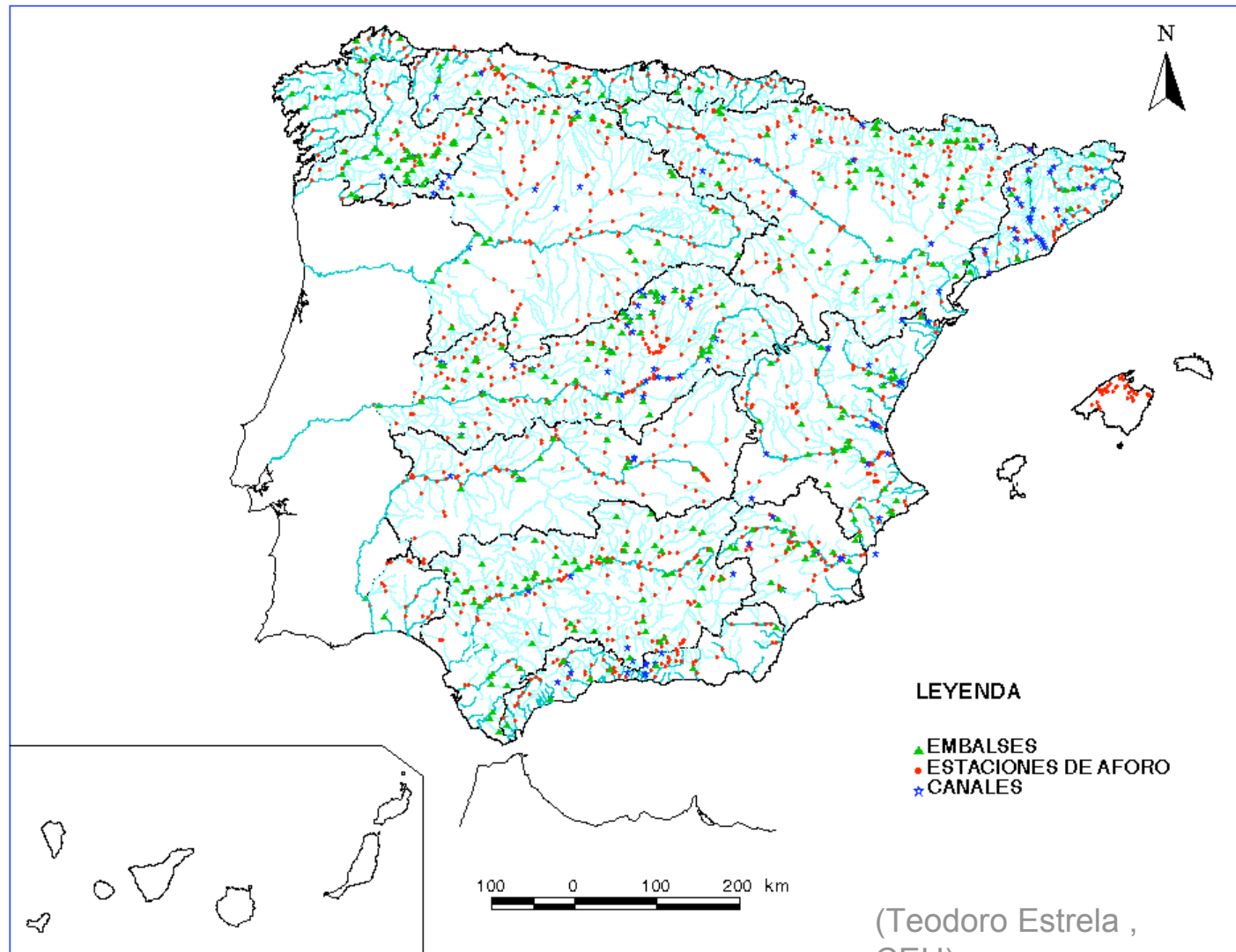
Francisco J. Tapiador
Institute of Environmental Sciences (ICAM)
University of Castilla-La Mancha, UCLM
Toledo, Spain

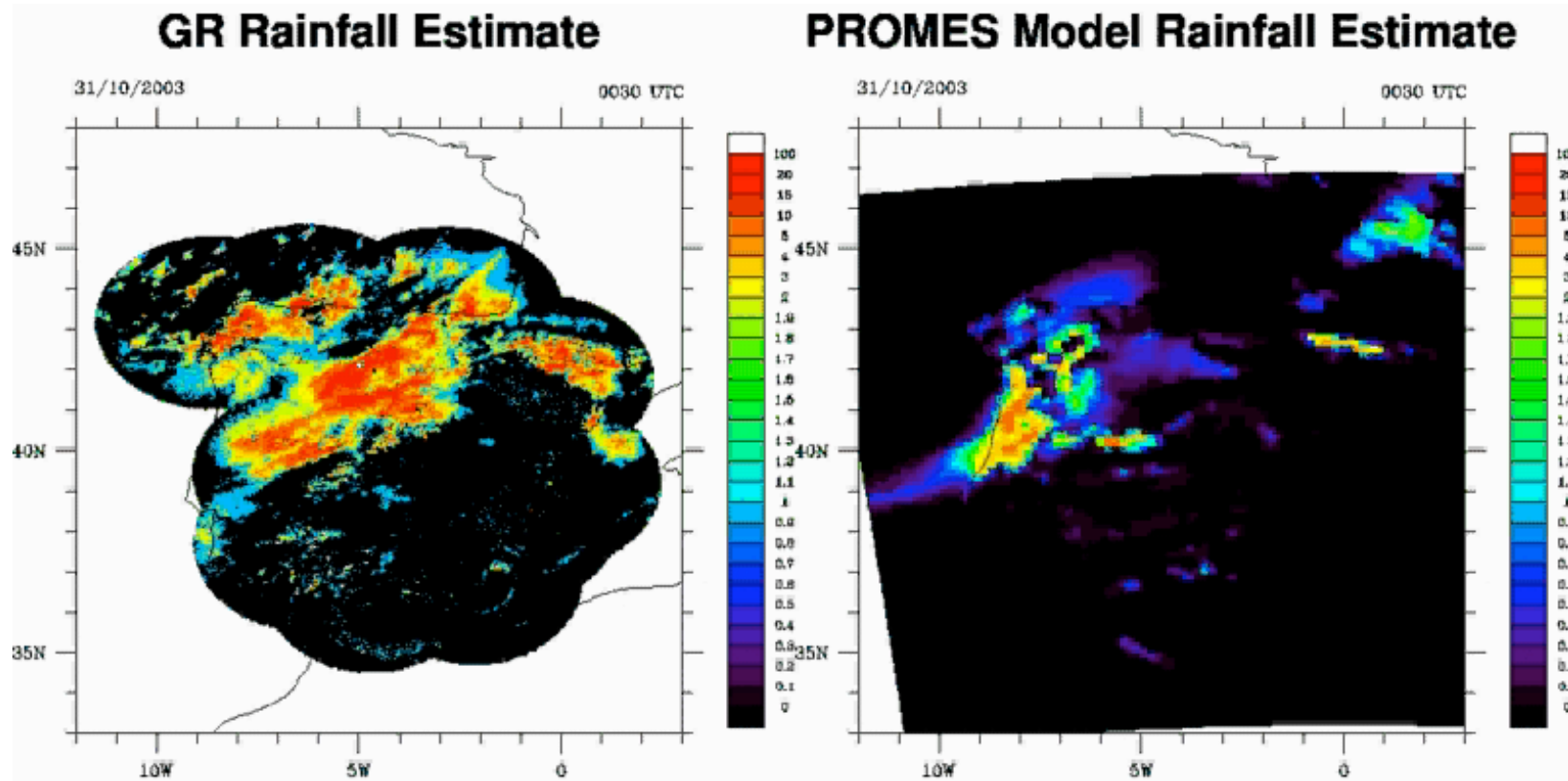
francisco.tapiador@uclm.es

Just in case...









‘Spanish GPM’

- UPC @ Barcelona
 - Daniel Sempere
 - Involving MeteoCat
- UCLM @ Toledo
 - Francisco J. Tapiador (and INM, Madrid, Spain)
 - As the Regional Met Center of Castilla-La Mancha

GPM at UCLM

Funding and human resources devoted to GPM activities

- **ASPRES**. National Project in the GPM framework, with INM on 4D data assimilation, 3 years from now
- **HYDROSAT**. Regional Project on Satellite Rainfall Estimation, 2.5 years from now.

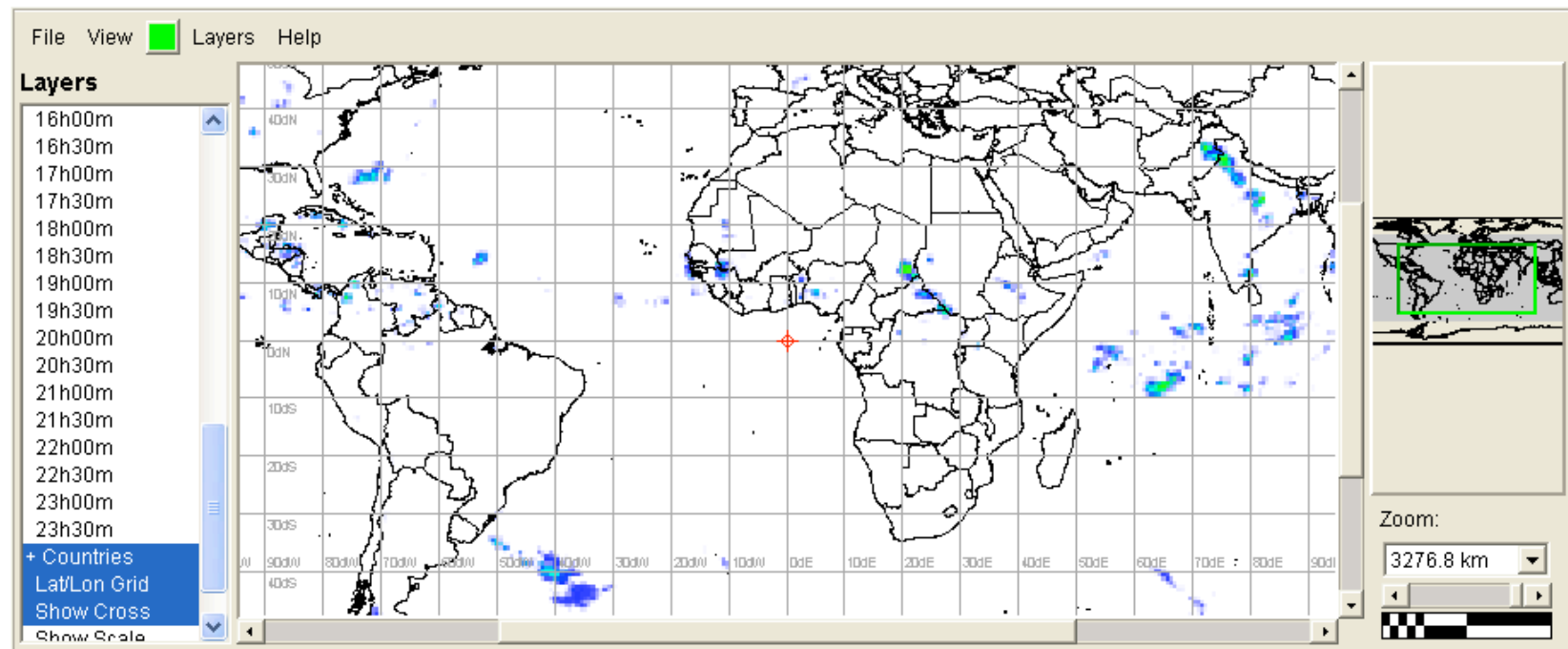
- Met Service {
- Remote Sensing group
 - 2 Staff
 - 4 PhD students
 - Meteorology and Climate group
 - 4 Staff
 - 8 PhD students

GPM at UCLM

Algorithms development

- Follow-up of the EURAINSAT EU project
- 3 algorithms
 - Neural Networks
 - Cloud motion winds PMW+IR estimate
 - EURAINSAT/A algorithm (public)
 - 4km/30 minutes resolution, 3 days lag
 - Used by some farmers for irrigation programming
- Towards a Radiative Transfer approach of Satellite Rainfall Estimation

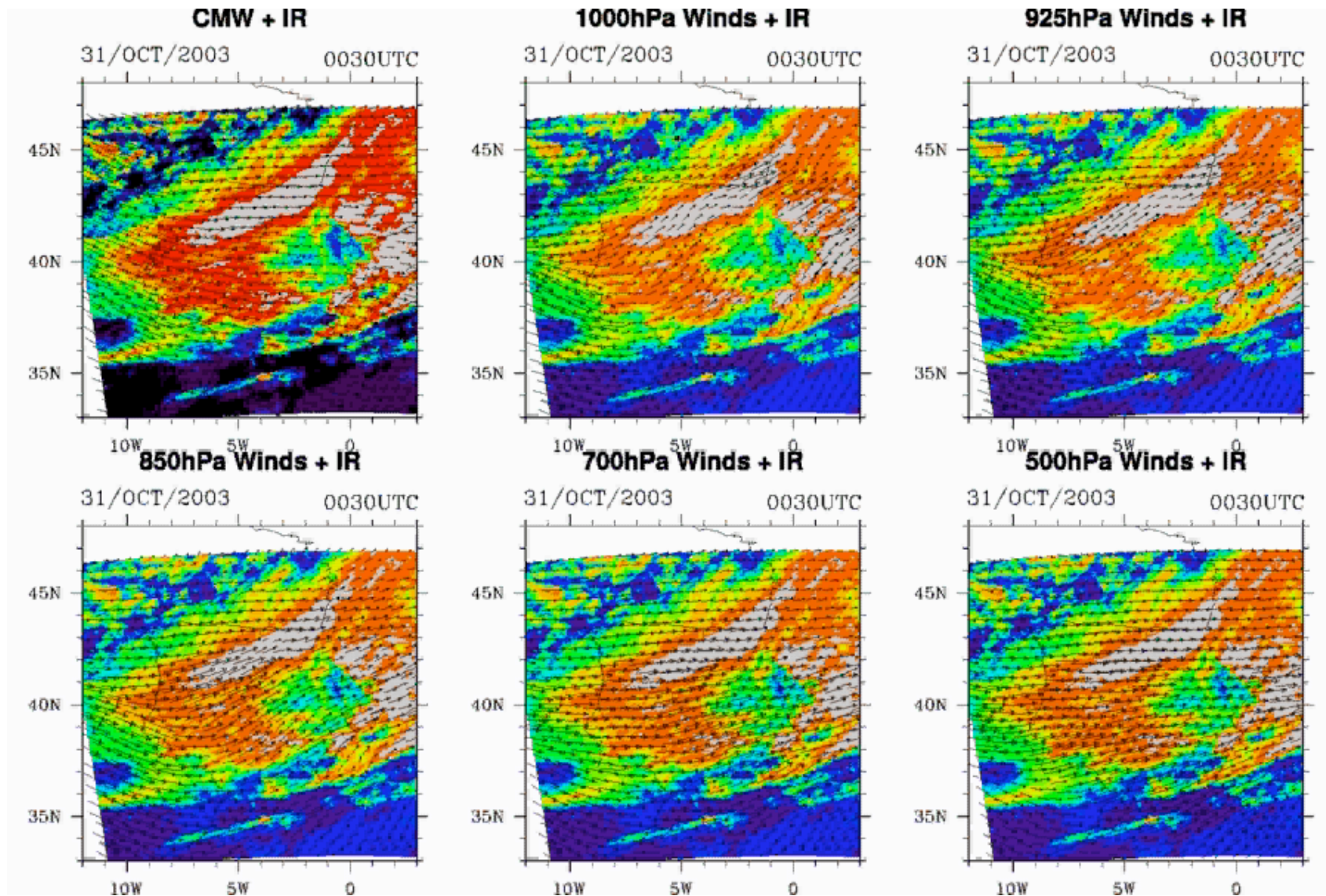
Global Satellite Quantitative Precipitation Estimates

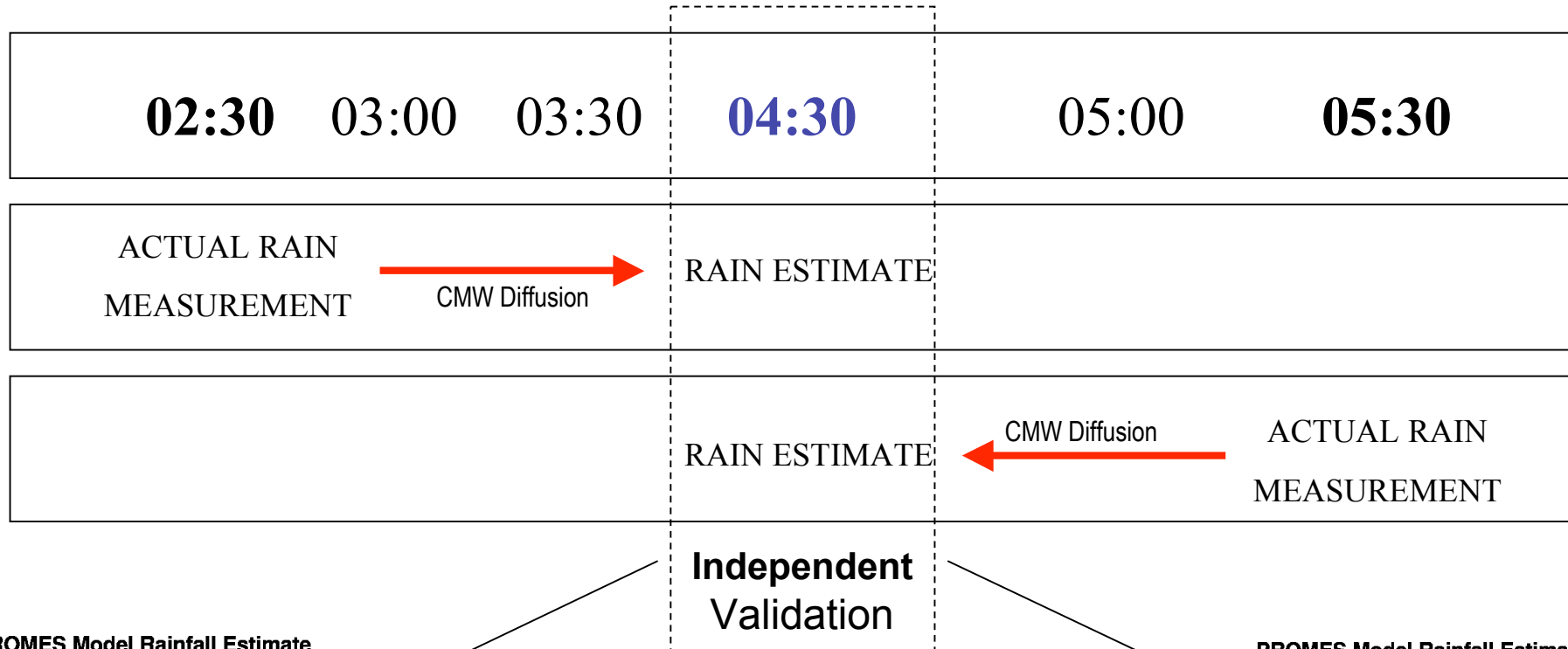
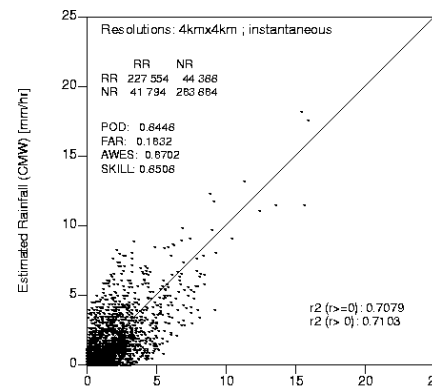
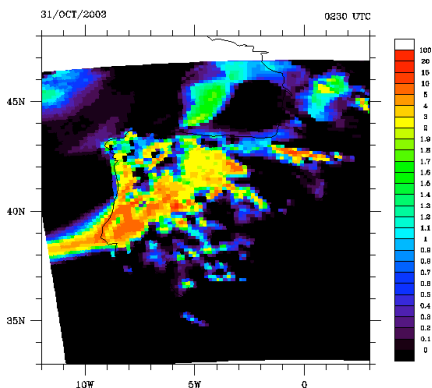


EURAINSAT/A 1.0 Rain Rates (mm/hr)

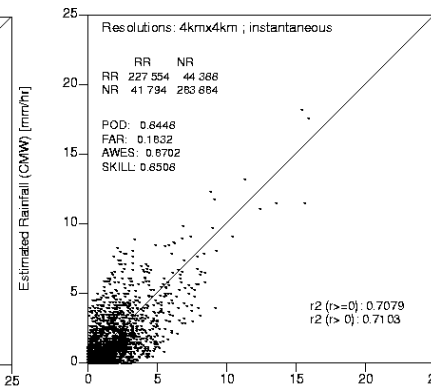
03/07/21

F.J.Tapiador

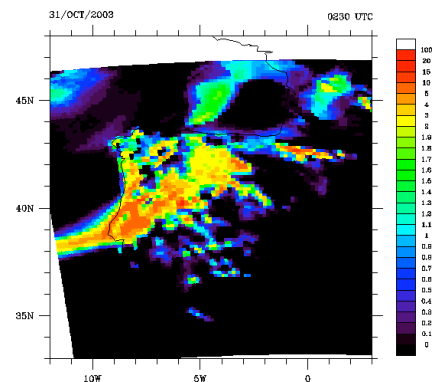


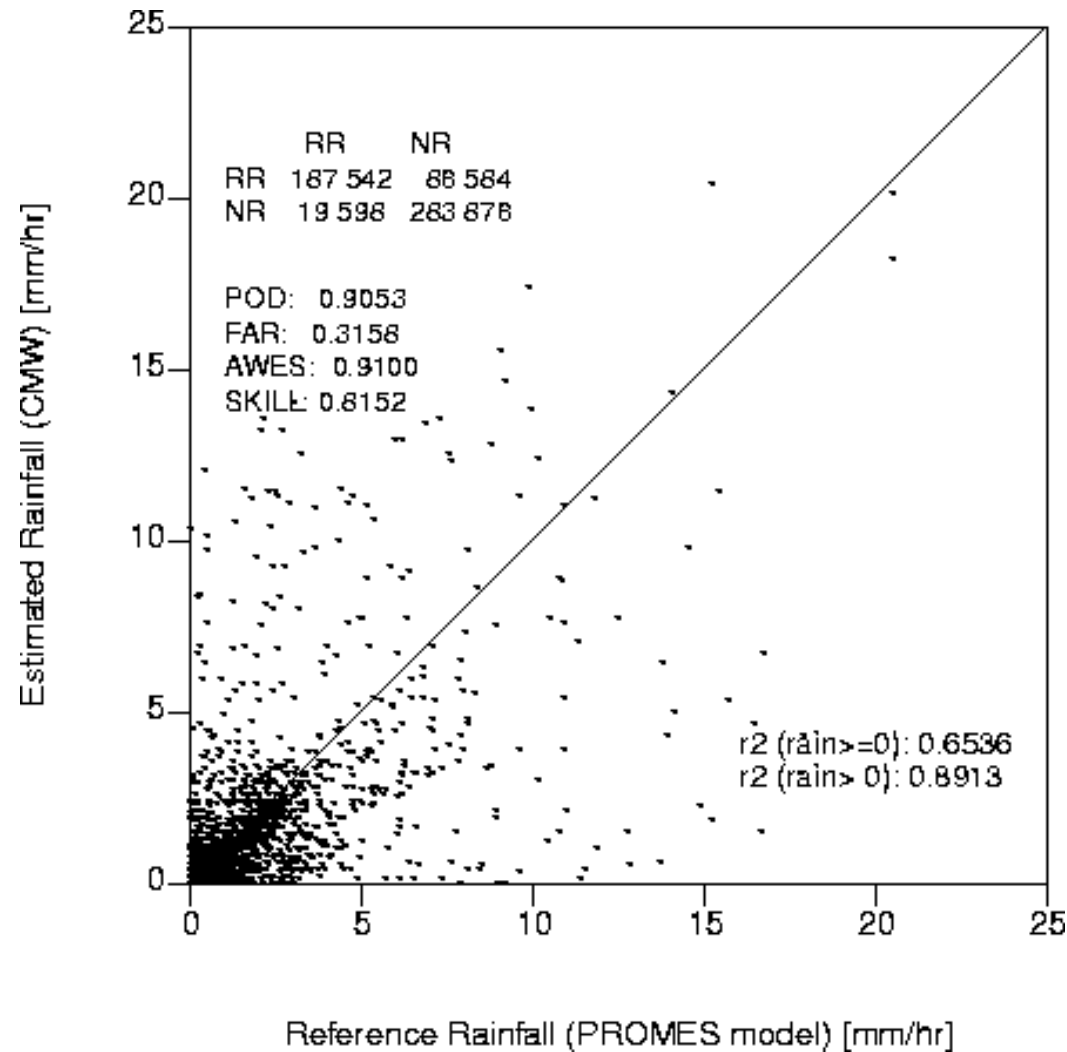

PROMES Model Rainfall Estimate


Reference Rainfall (PROMES model) [mm/hr]



Reference Rainfall (PROMES model) [mm/hr]

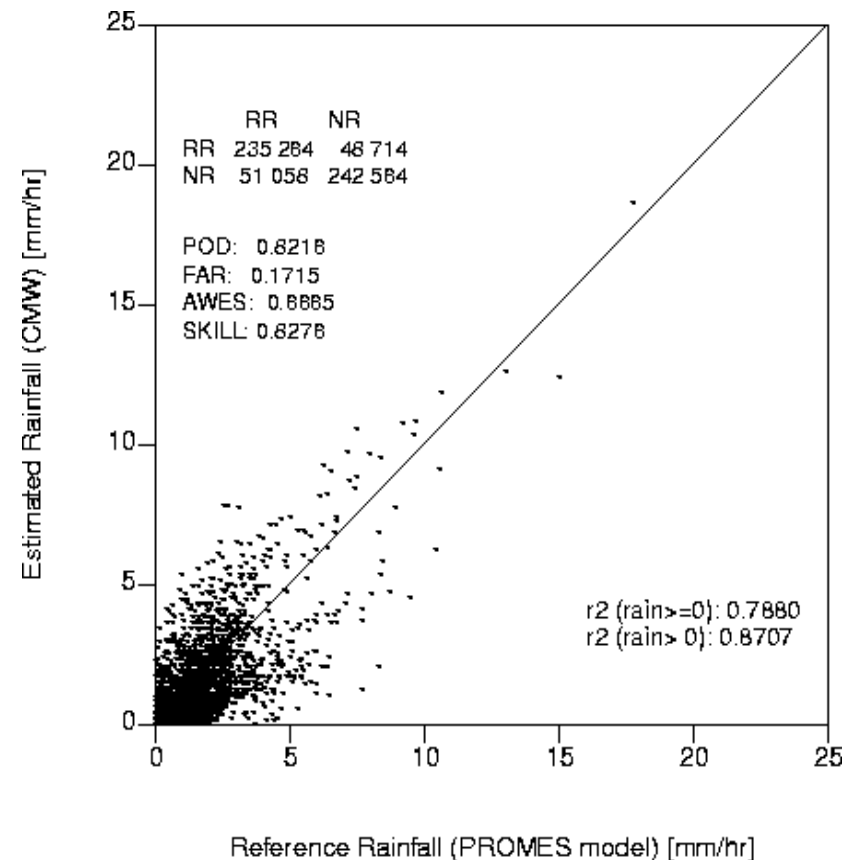
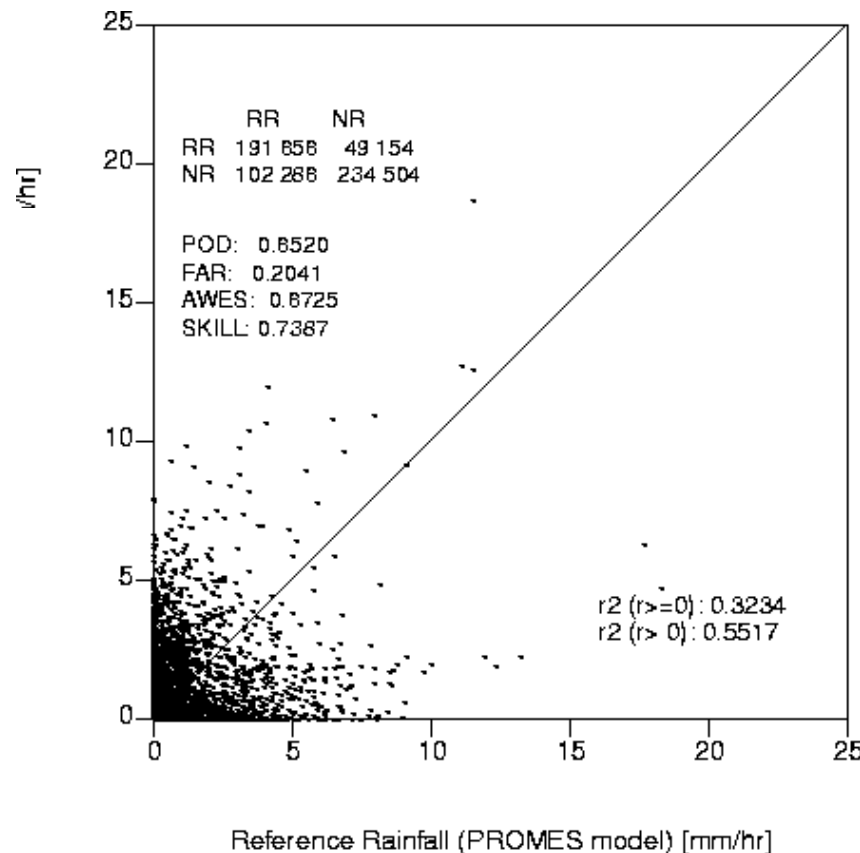
PROMES Model Rainfall Estimate




**Comparison between
CMW estimate and
(independent)
reference rainfall for
16:30 TUC**

(forward propagation)

What if we use the 02:30 *measure* instead of the 04:30 CMW-scheme estimate when comparing @ 04:30?



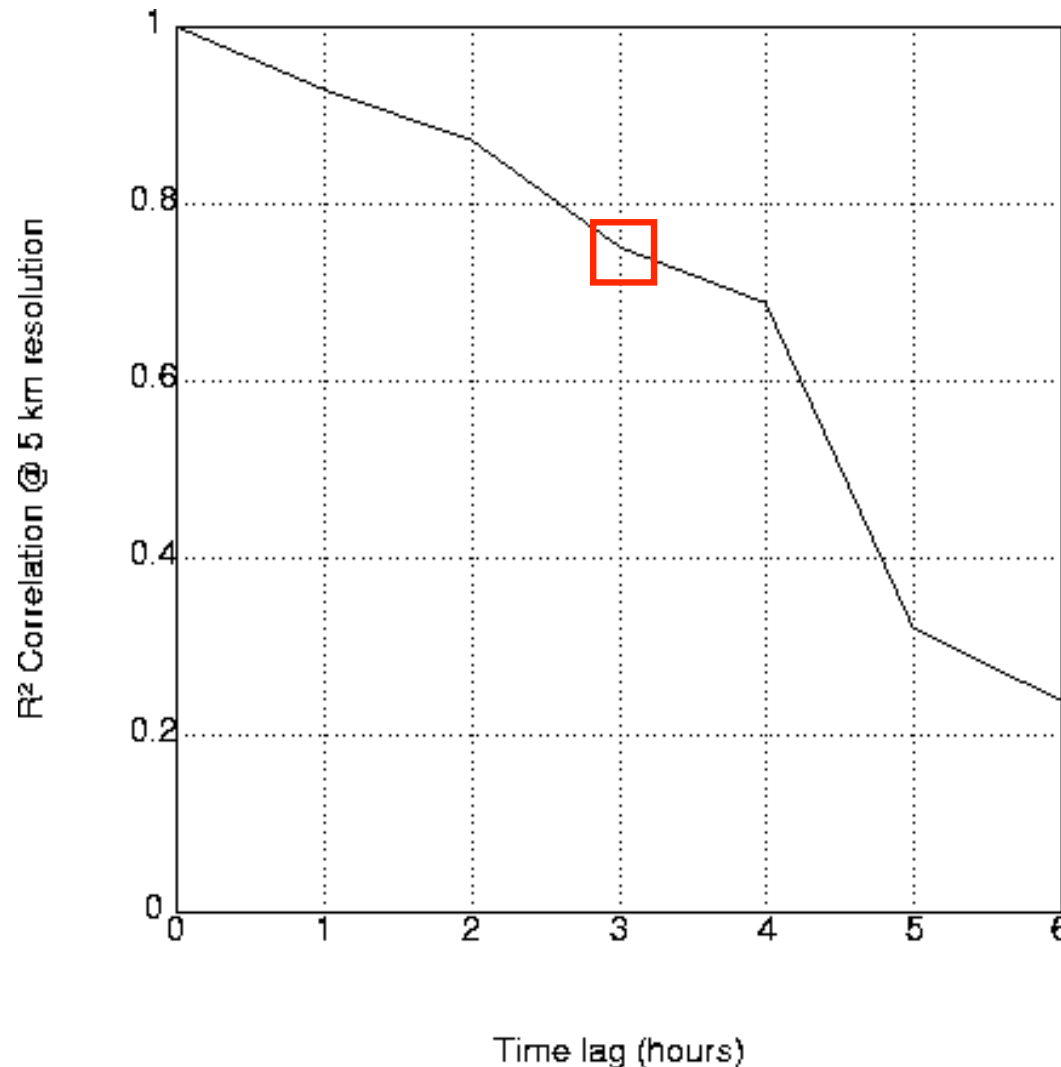
So, the CMW scheme is actually transporting rainfall

Time degradation:

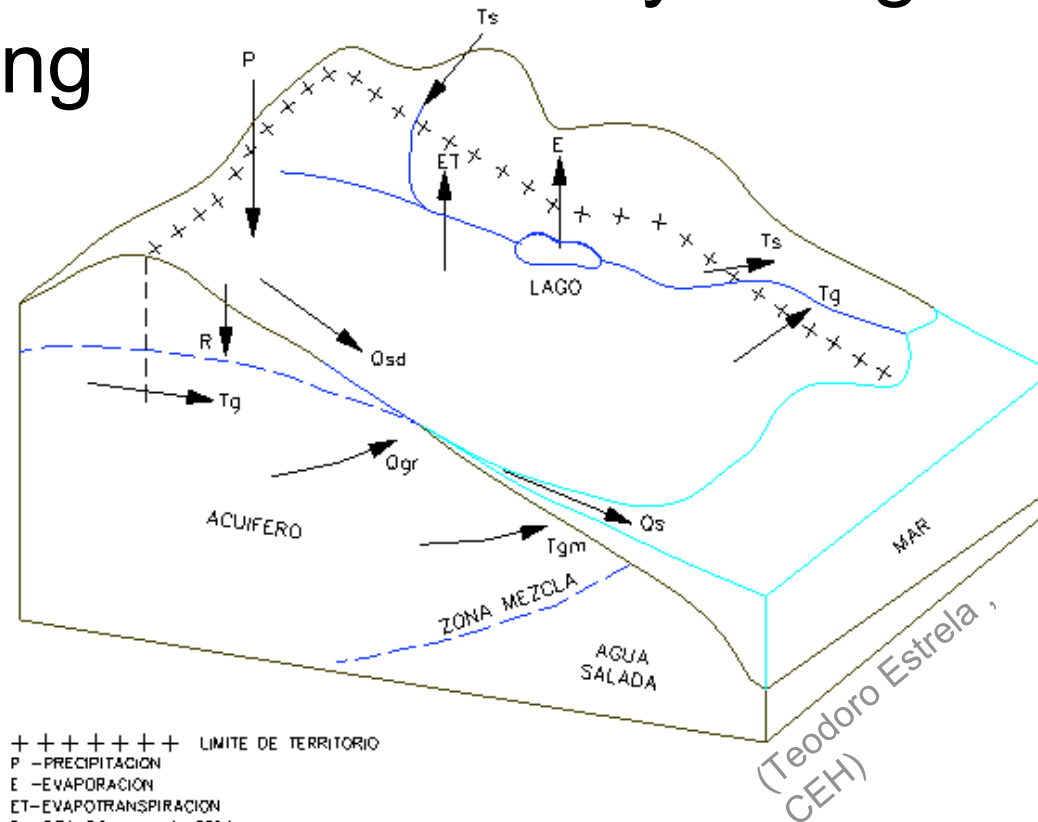
**Average for
31/OCT/2003**

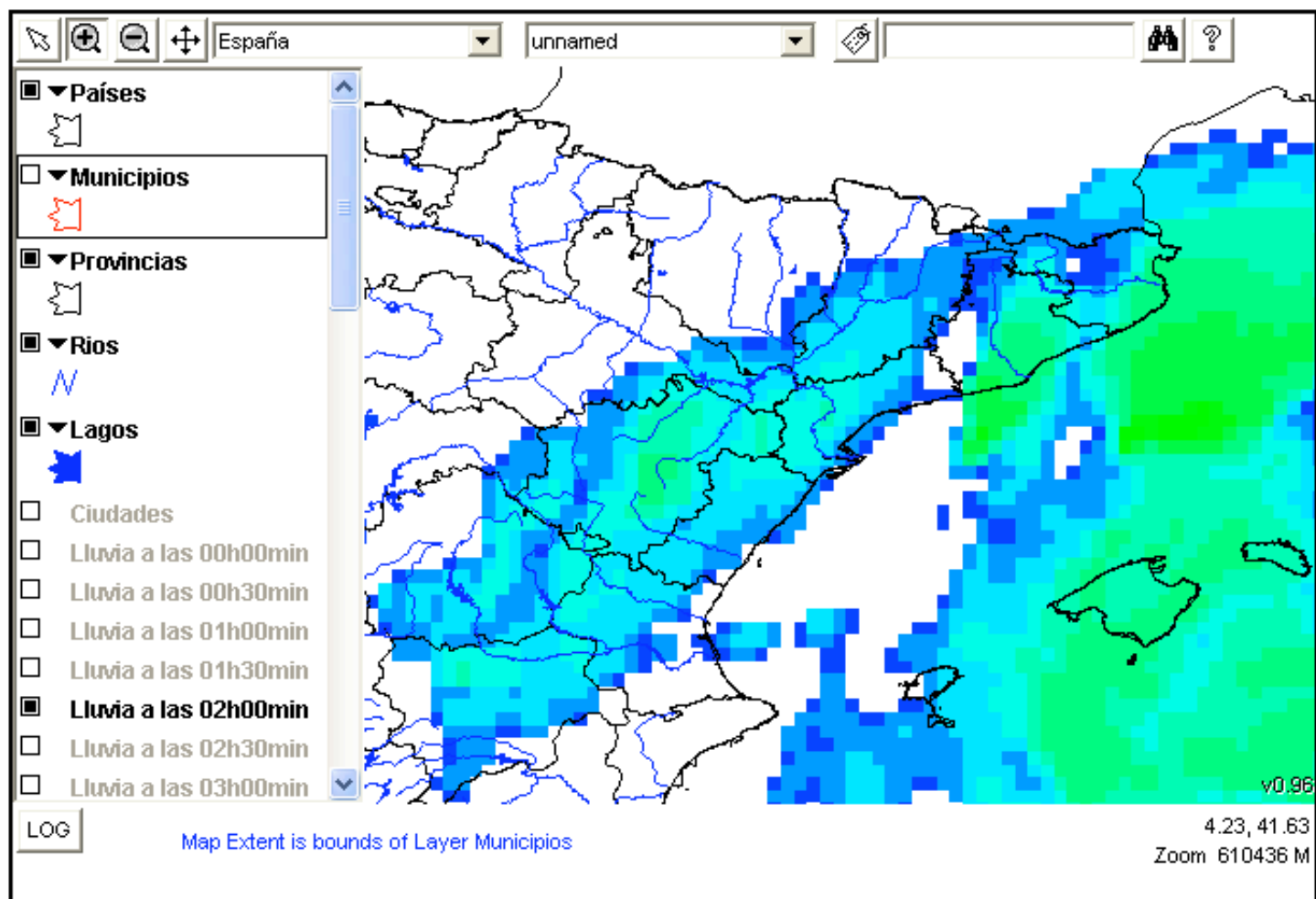
**Using the CMW, we can maintain
correlations > 0.80 for up to 2.5
hours**

**The performances of the
advection method are (obviously)
linked with the quality of the
rainfall estimate to be
transported**



Satellite Estimates for Hydrological modelling

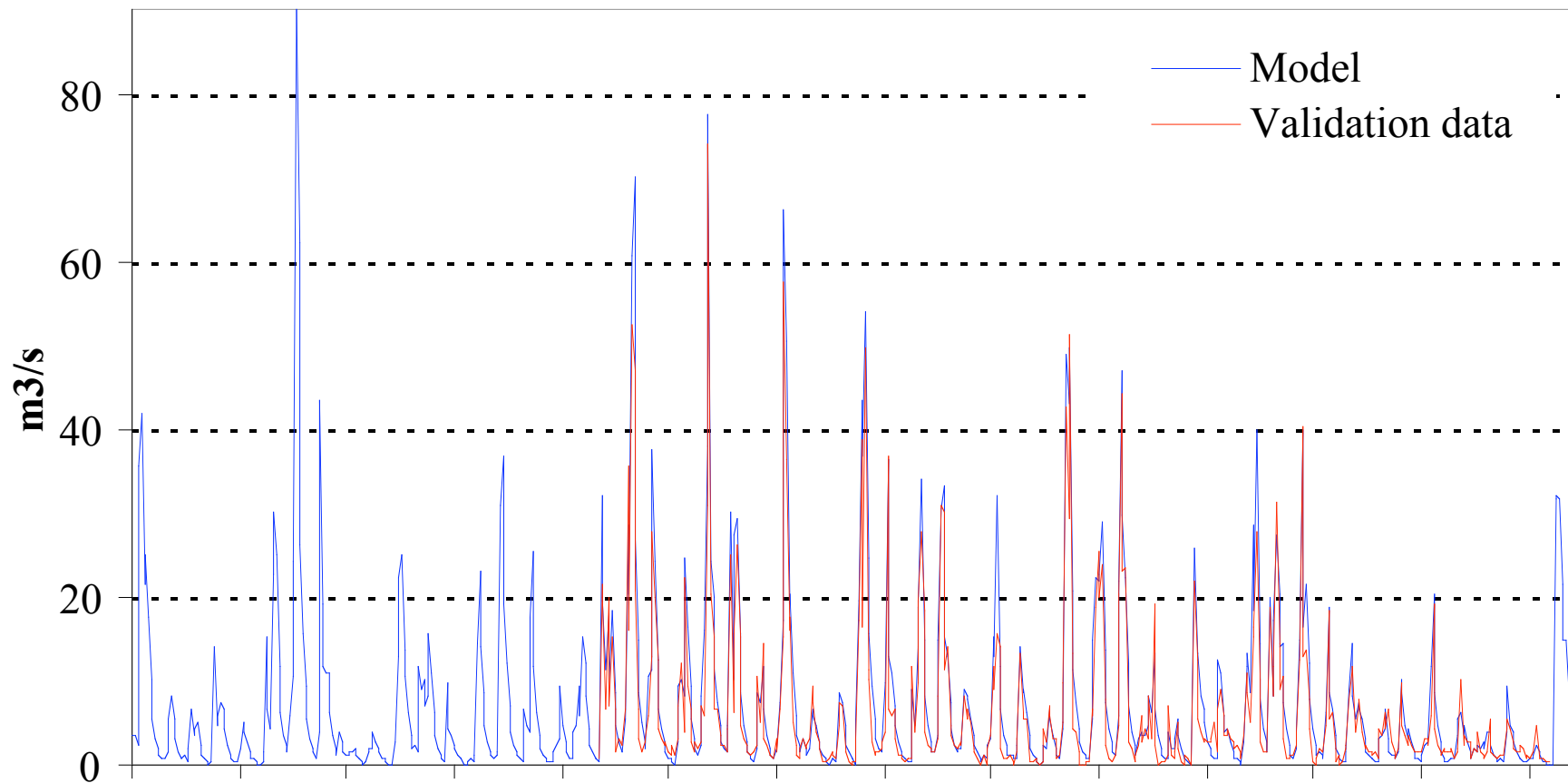




Francisco J. Tapiador

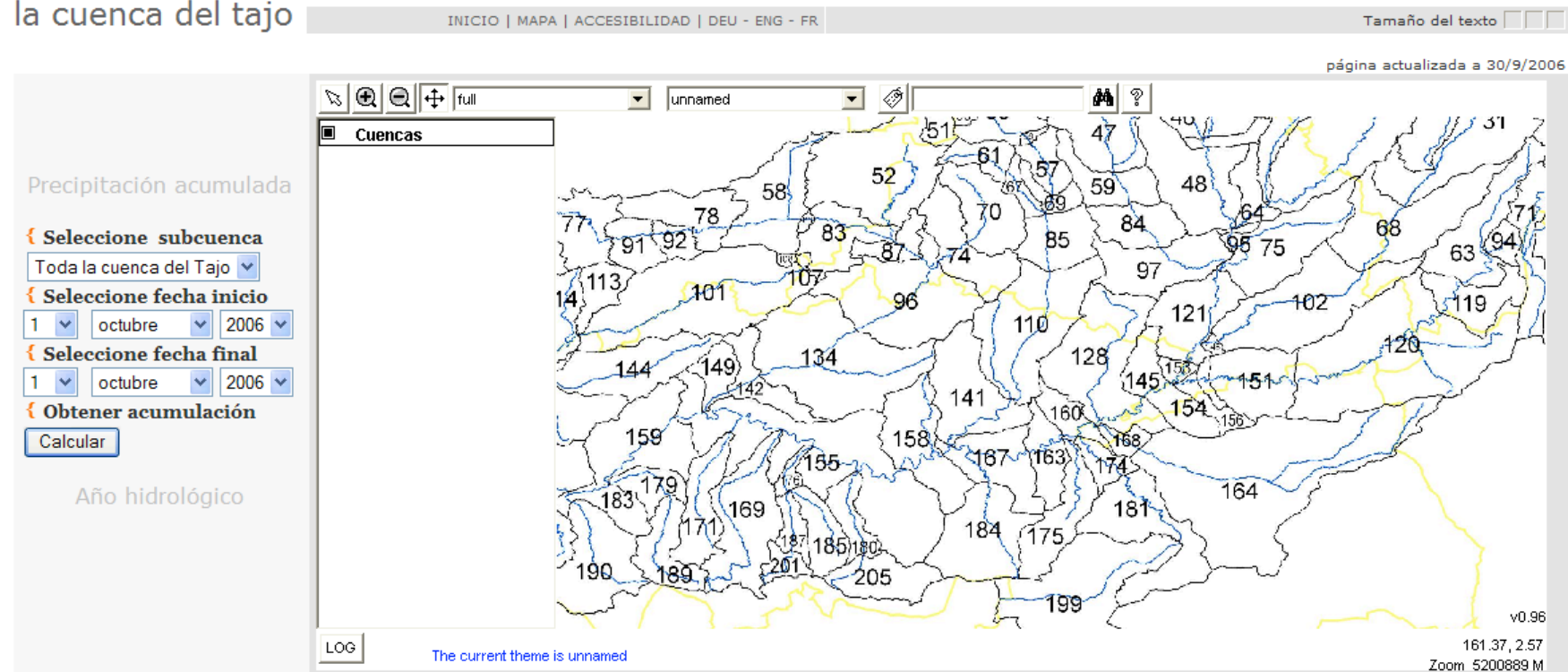
Fecha: 17/09/2005

Hydrological modelling



Hydrological modelling at basin level

la cuenca del tajo



INICIO | MAPA | ACCESIBILIDAD | DEU - ENG - FR

Tamaño del texto

la precipitación

{ La precipitación





- » La lluvia
- » La nieve
- » El granizo
- » Otros hidrometeoros

{ Su medida por satélite

- » La medida de la precipitación
- » Datos de infrarrojo
- » Datos de microondas
- » Fusión de datos
- » Algoritmos y métodos

{ Las predicciones

- » Ahora
- » 24 horas
- » 48 horas
- » 72 horas



BUSCADOR

Teledetección

Desde el 30/09/06:
Estimaciones por satélite cada 30 minutos

Cuencas hidrográficas

Desde el 01/10/2006:
Estimaciones acumuladas en la cuenca del Tajo

Información adicional

- » Recursos hídricos
- » La GPM
- » Proyectos de investigación

INICIO | MAPA | ACCESIBILIDAD | DEU - ENG - FR

Tamaño del texto



la nieve

{ La precipitación

- » La lluvia
- » La nieve
- » El granizo
- » Otros hidrometeoros

{ Su medida por satélite

- » La medida de la precipitación
- » Datos de infrarrojo
- » Datos de microondas
- » Fusión de datos
- » Algoritmos y métodos

{ Las predicciones

- » Ahora
- » 24 horas
- » 48 horas
- » 72 horas

{ La nieve es una forma de precipitación fundamental para el ciclo hidrológico. Es también un indicador de los efectos del cambio climático.

- » La nieve representa un volumen de precipitación muy importante para la Península Ibérica, suponiendo un porcentaje notable del agua de los ríos españoles, sobre todo en la España atlántica.

{ La medida de la nieve mediante satélite se realiza con radiómetros a bordo de satélites polares, que miden en el rango de las microondas.

BUSCADOR

 **Teledetección**

Desde el 30/09/06:
Estimaciones por satélite cada 30 minutos 

 **Cuencas hidrográficas**

Desde el 01/10/2006:
Estimaciones acumuladas en la cuenca del Tajo 

 **Información adicional**

- » Recursos hídricos
- » La GPM
- » Proyectos de investigación

UCLM/MOMAC © Francisco J. Tapiador | Créditos

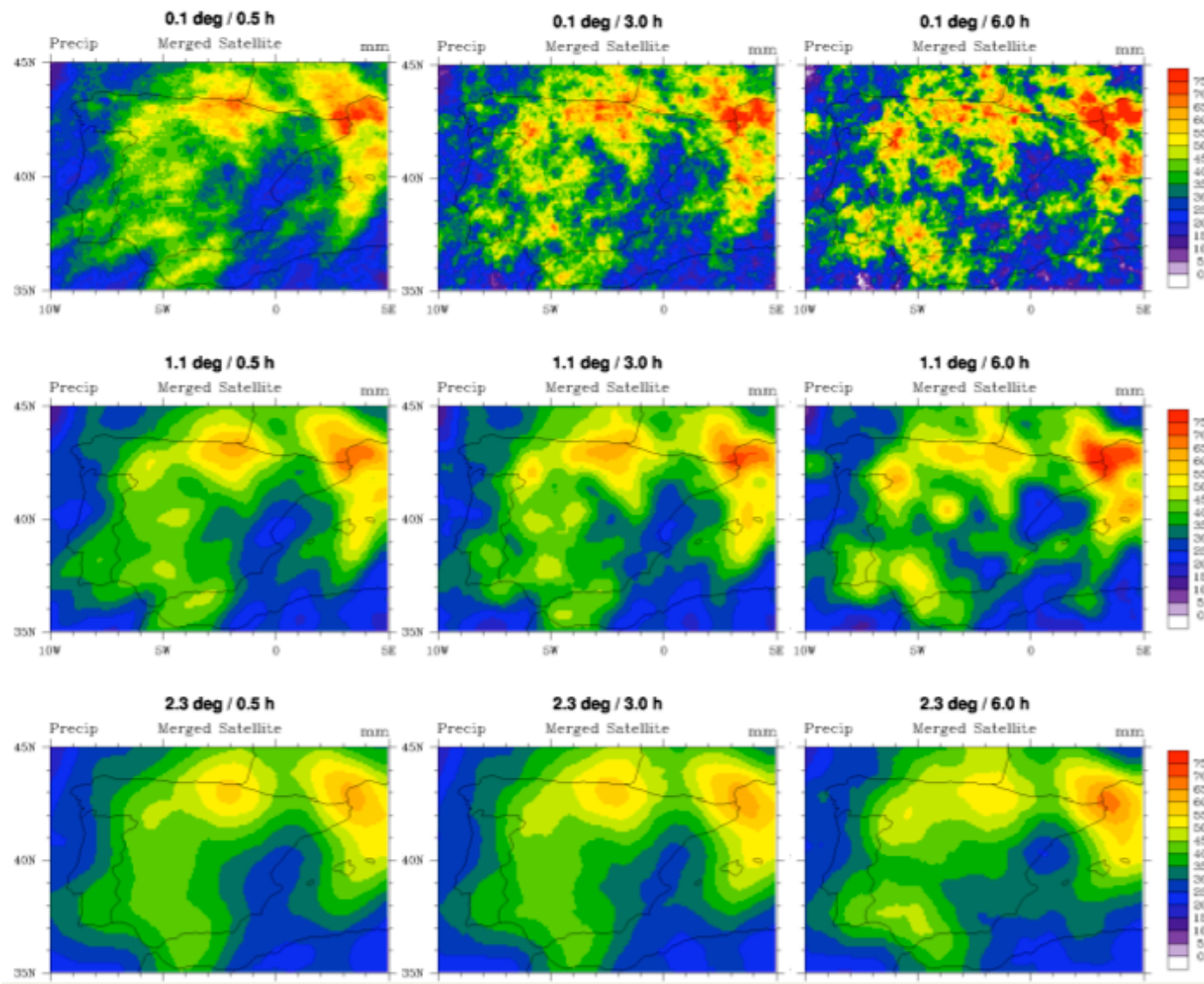
Enlaces de interés

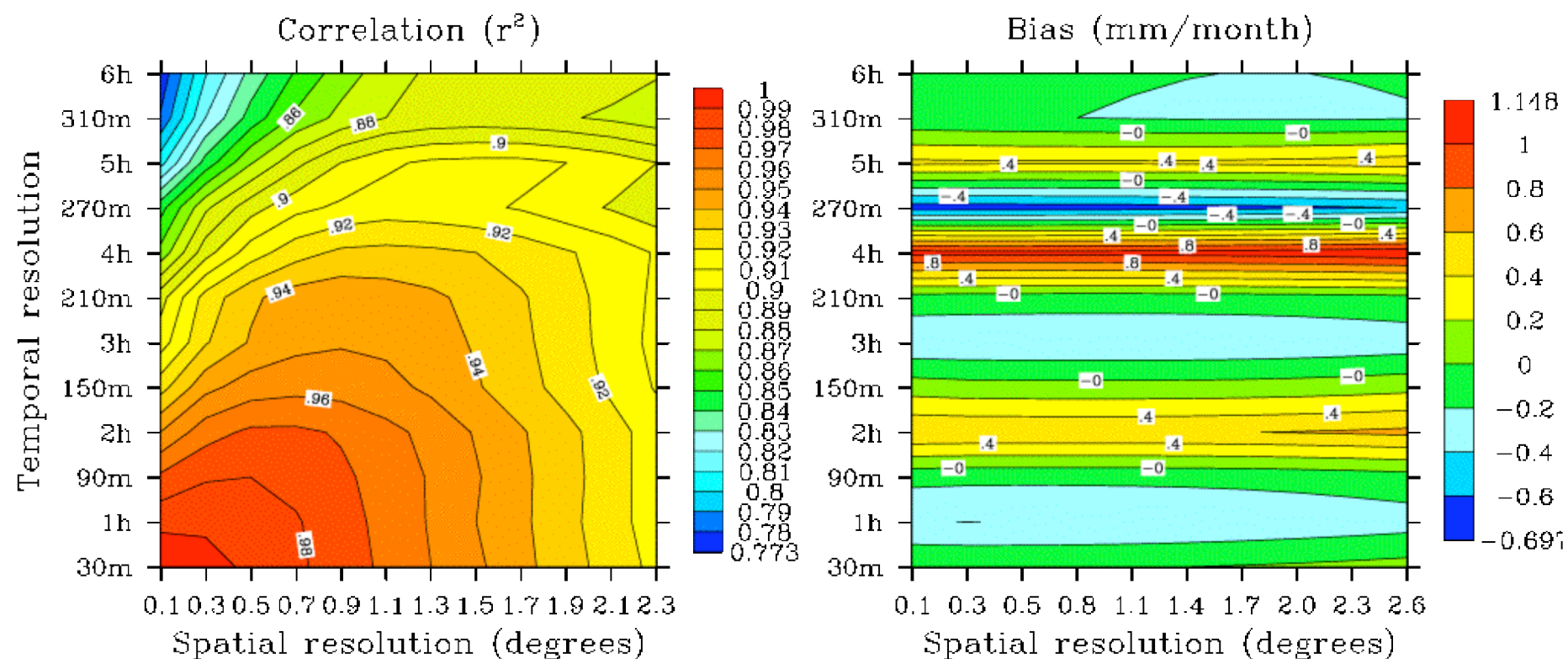
Colaboraciones

Contactar

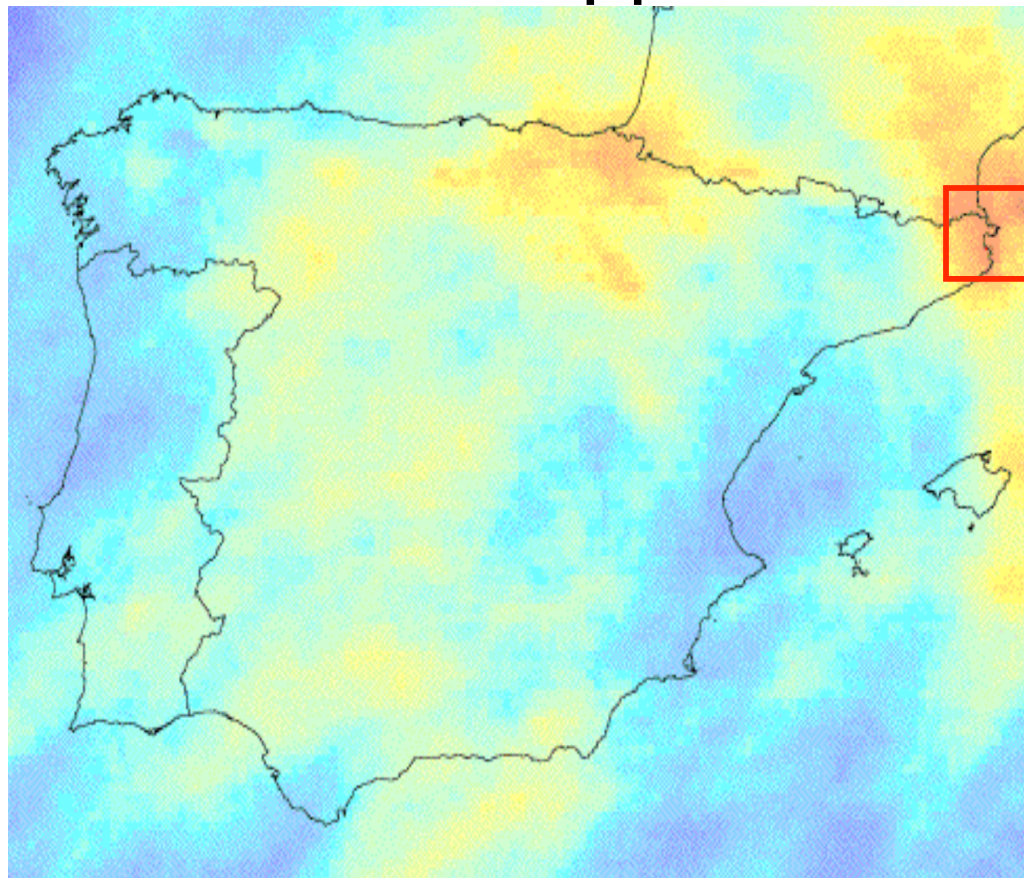
Validation

- 1- EUMETSAT Convective Rain Rate product
- 2- Global IPWG algorithms validation over Spain

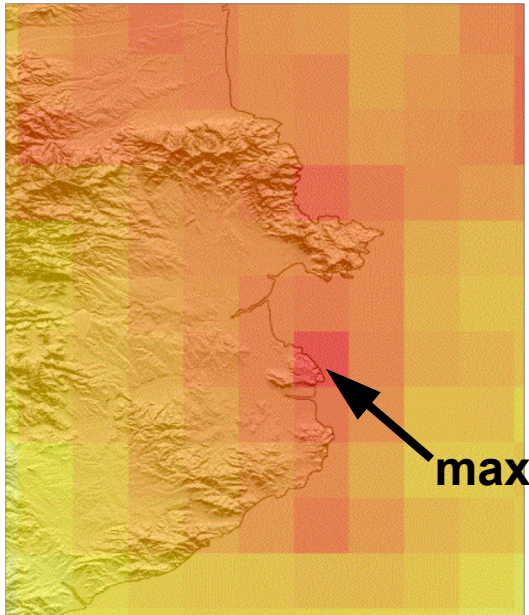




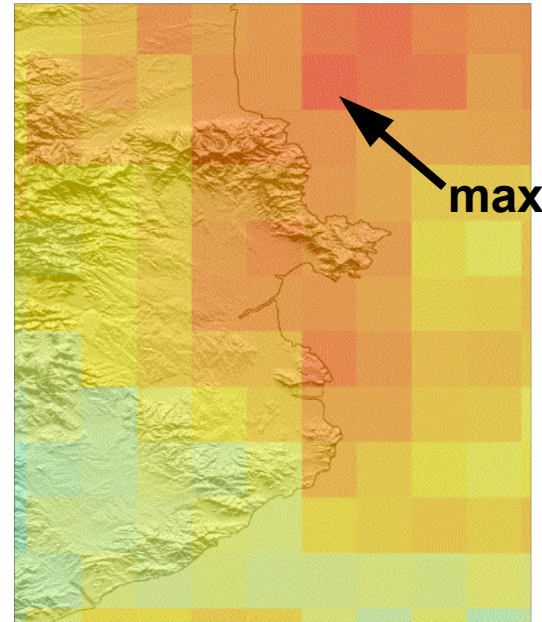
Estimating uncertainties and errors for real applications



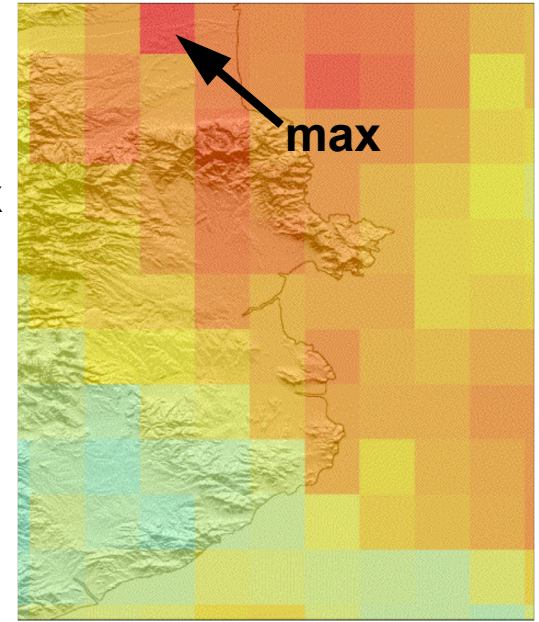
30 min sampling, 0.1 deg resolution



180 min sampling, 0.1 deg resolution 360 min sampling, 0.1 deg resolution




0 5 10 20 30 40 50 60 70 80
Kilometers



0 5 10 20 30 40 50 60 70 80
Kilometers

Errors in estimating high rainfall rates in the Mediterranean

Dirección <http://nwcsaf.inm.es/>
▼ ➡



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[Meteorological Products](#)

[Consortium Members](#)

[Visiting Scientist Activities](#)

[SW Delivery Conditions](#)

You are not registered.
Sign in.

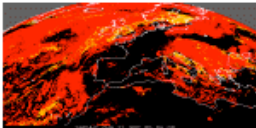
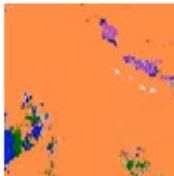
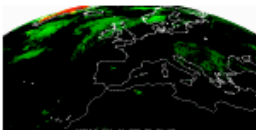
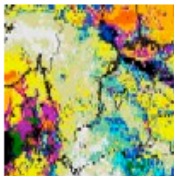

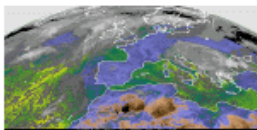
User

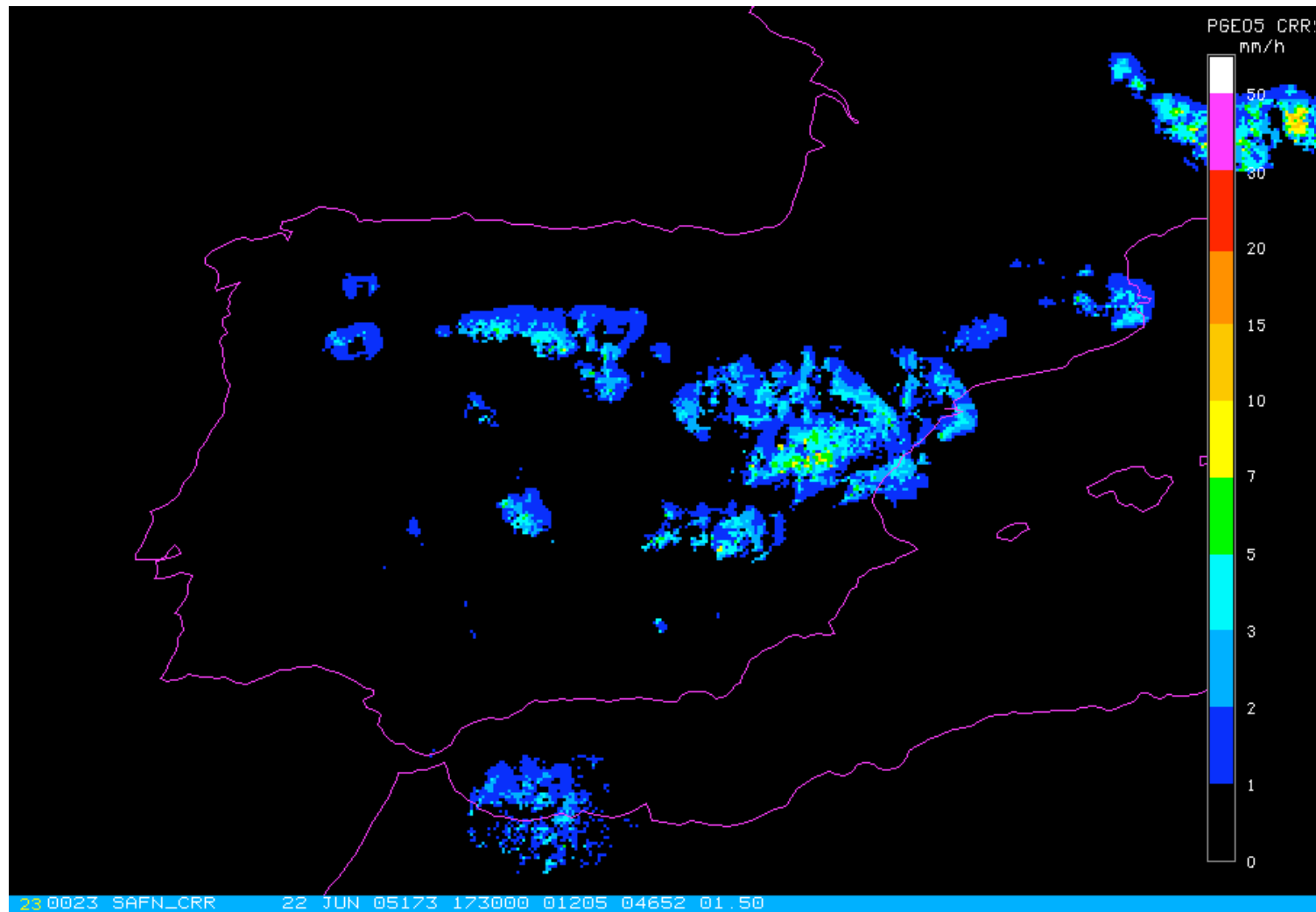
Password

Meteorological products information

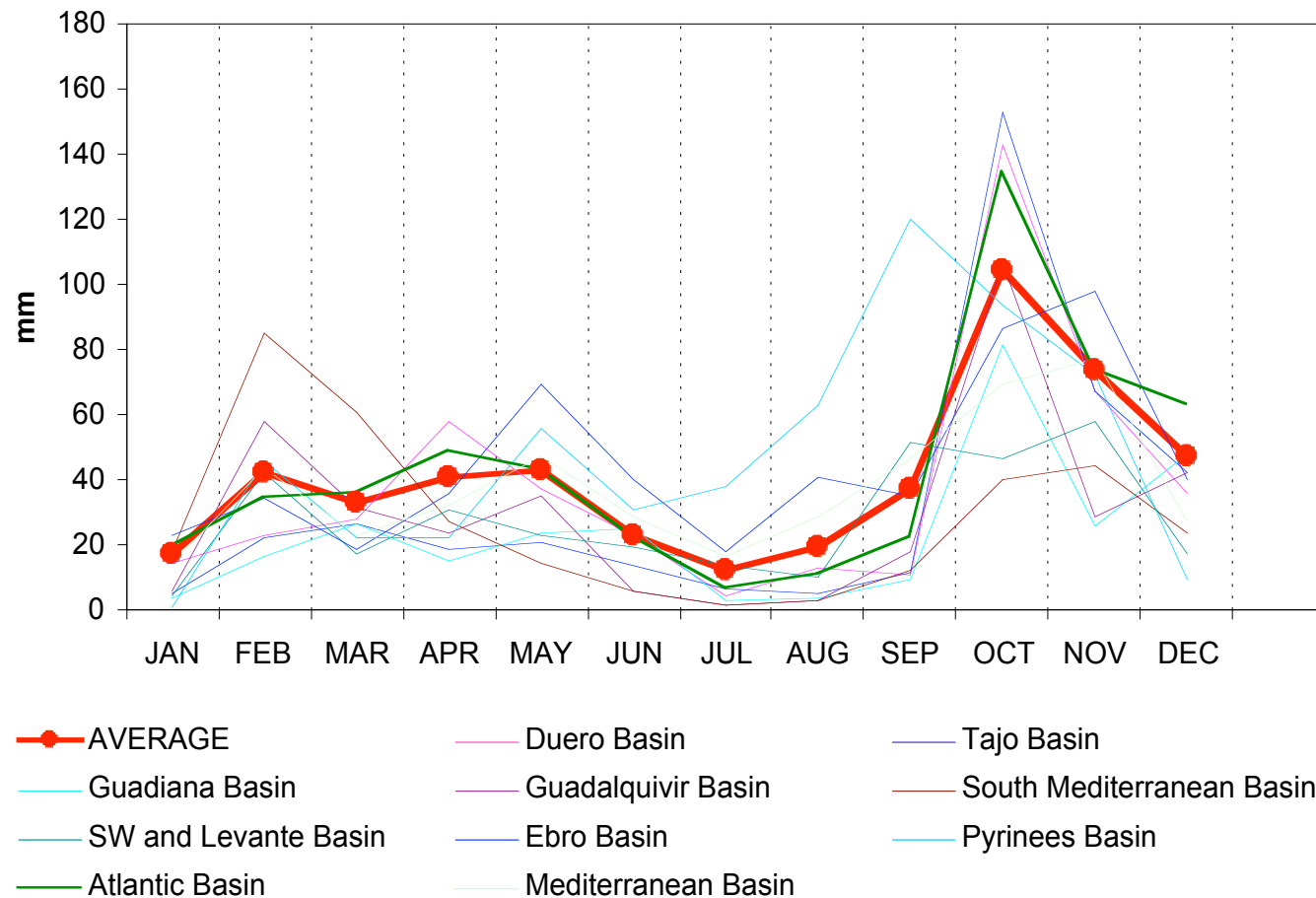
Products Summary Description & Examples

For MSG products (except ASII), click on icon to access more information about each product. For all MSG and PPS products, click on underlined text to display the Product Summary Description and on dark blue text to display other examples.

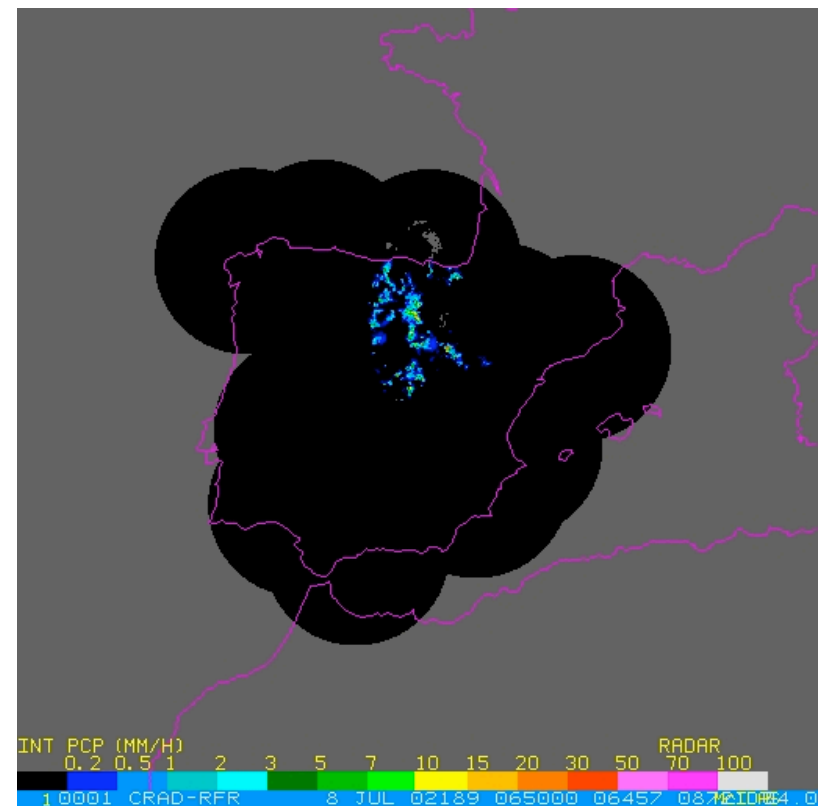
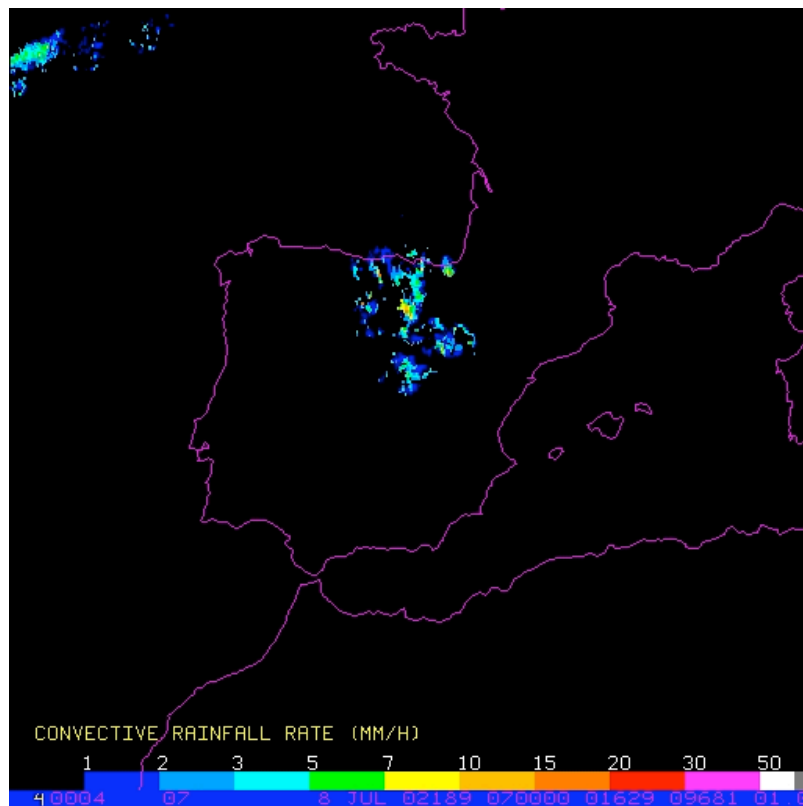
| MSG | PPS |
|--|---|
|  <u>PGE01: CMa (Cloud Mask)</u> |  <u>PGE01b: CM (Cloud Mask)</u> |
| CMa, CT & CTTH Examples from MSG/SEVIRI, MODIS and GOES-East | |
|  <u>PGE04: PC (Precipitating Clouds)</u> |  <u>PGE02b: CT (Cloud Type)</u> |
|  <u>PGE05: CRR (Convective Rainfall Rate)</u> |  <u>PGE06: TPW (Total Precipitable Water)</u> |



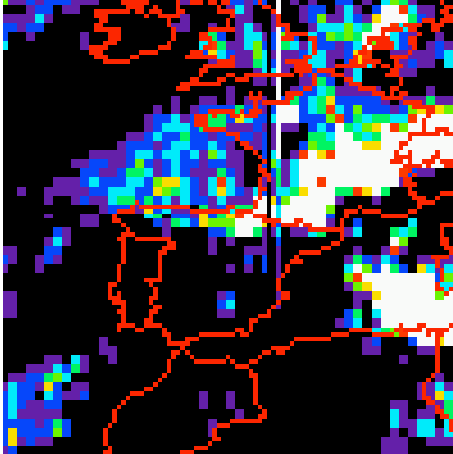
Monthly Average Precipitation in Spain by Basin (2005)



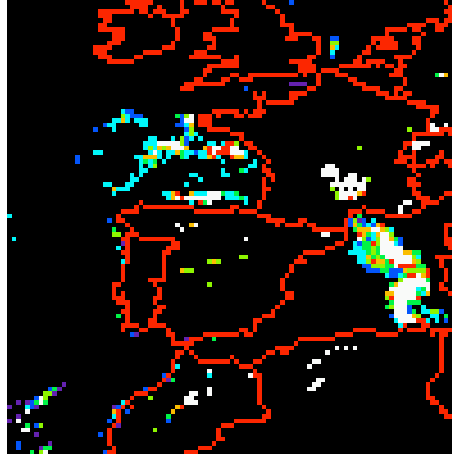
GR comparison



NOGAPS

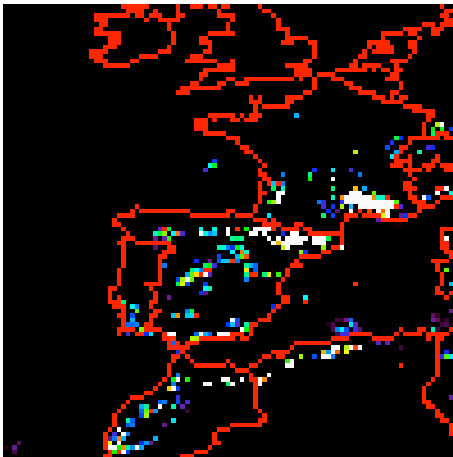


Geo

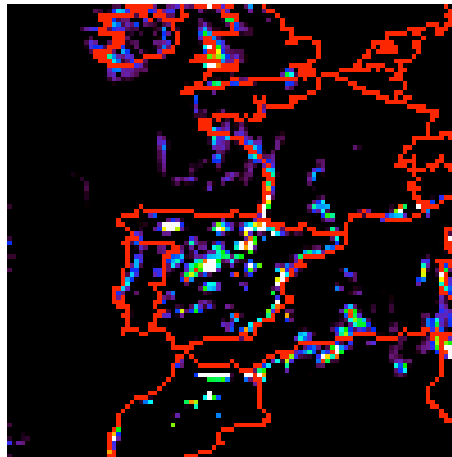


00Z-00Z products

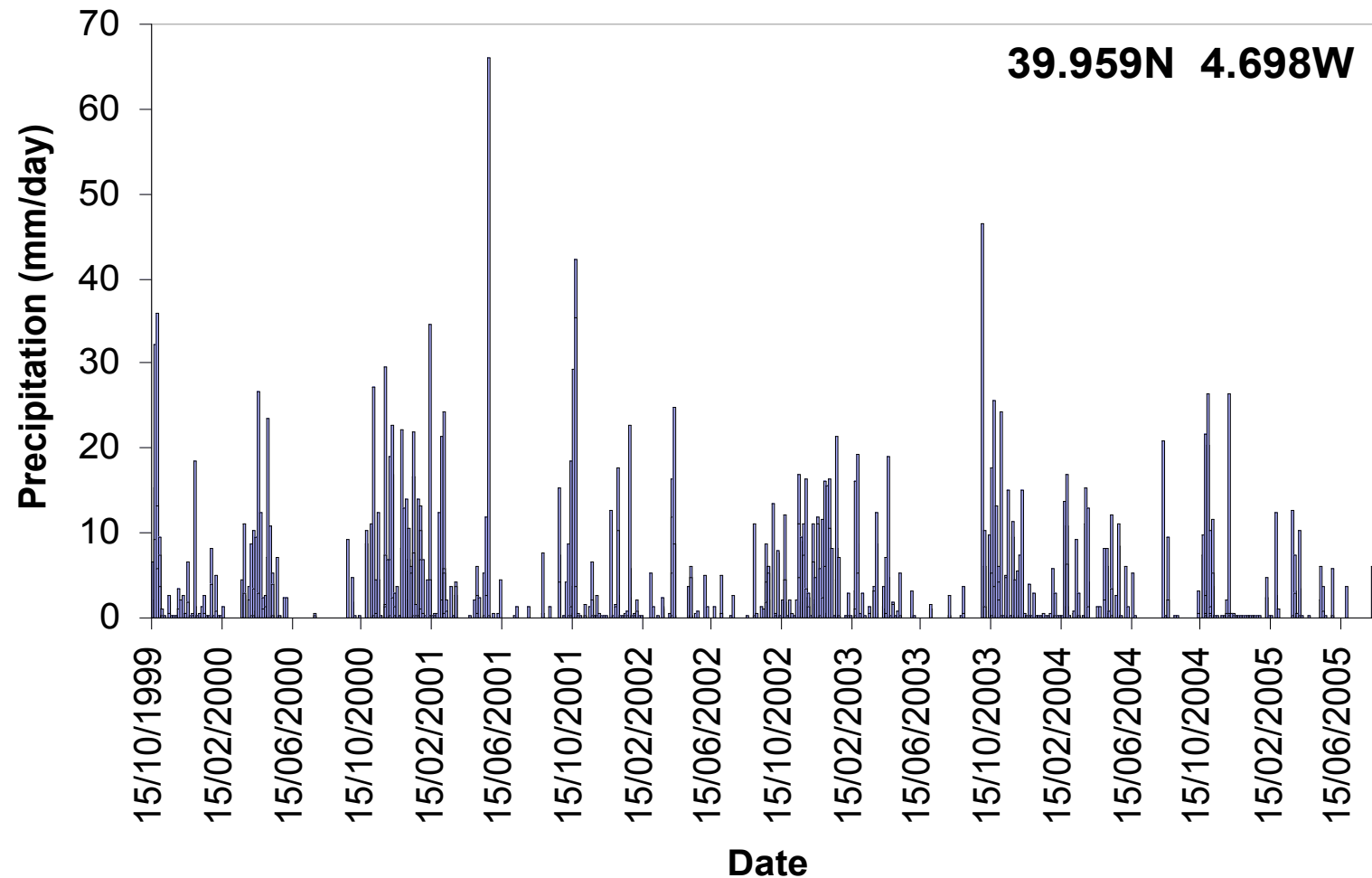
NRL PMW



CPC



Six years worth of QC gauge data

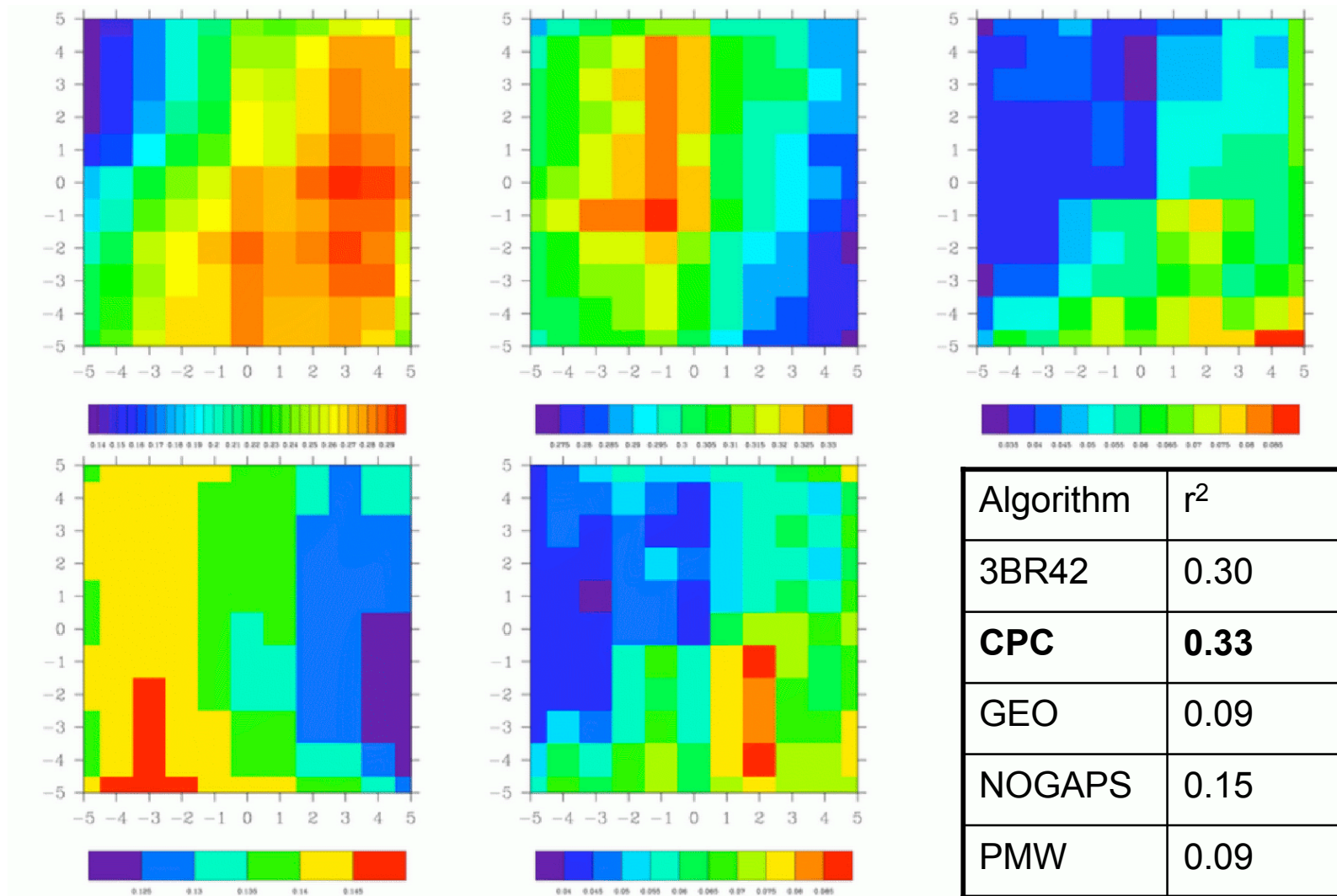




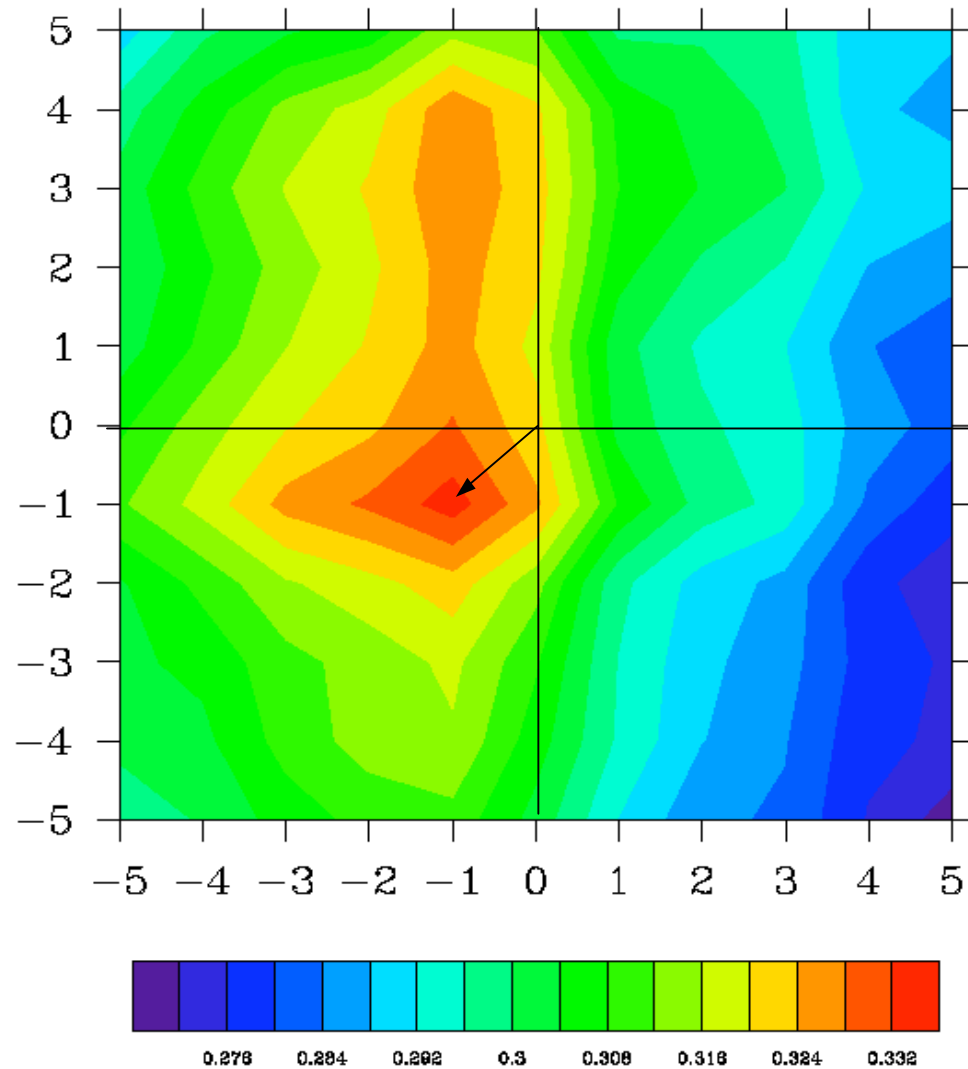
Rain Gauges



Geolocation error

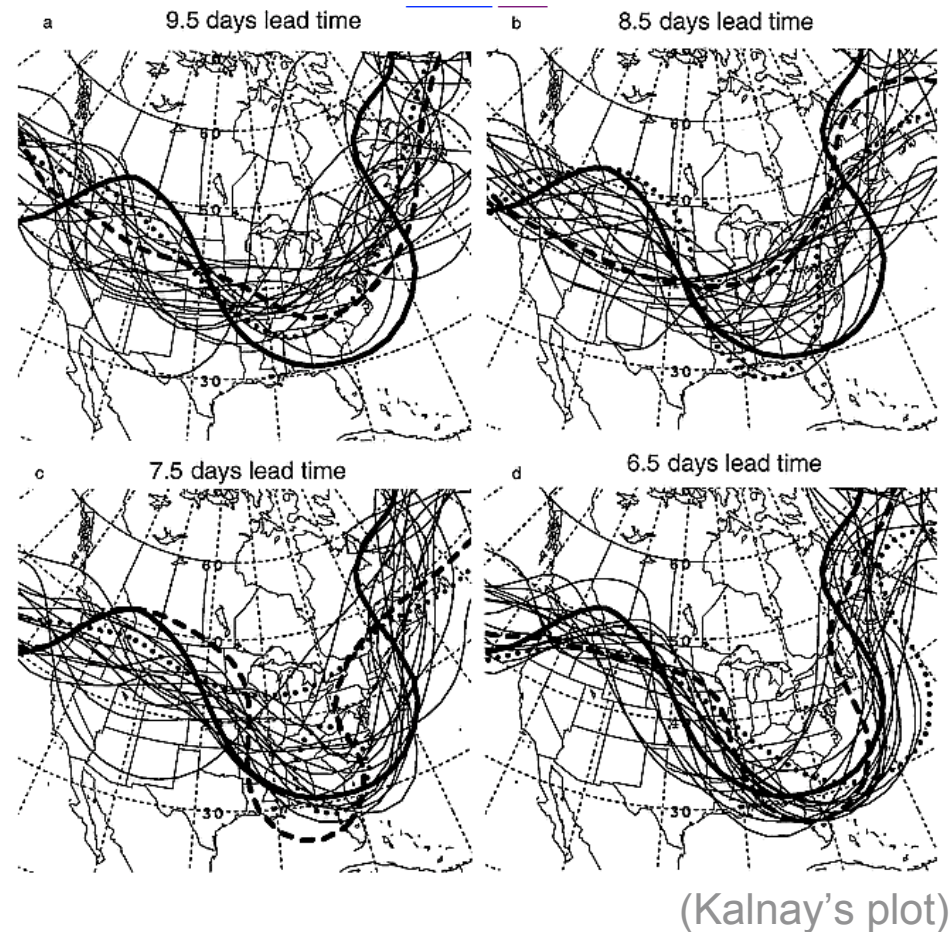
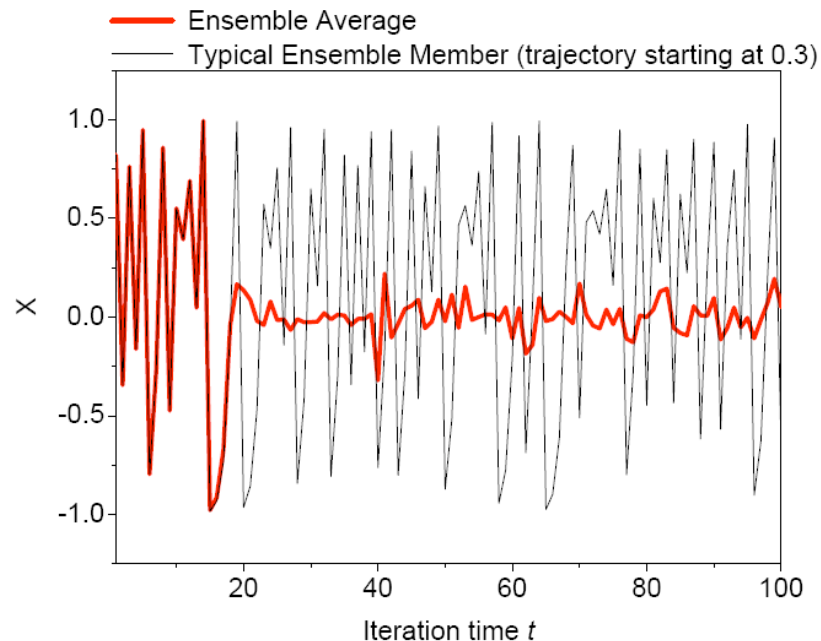


Best correlation:
CPC Morphing
(~5km displacement)



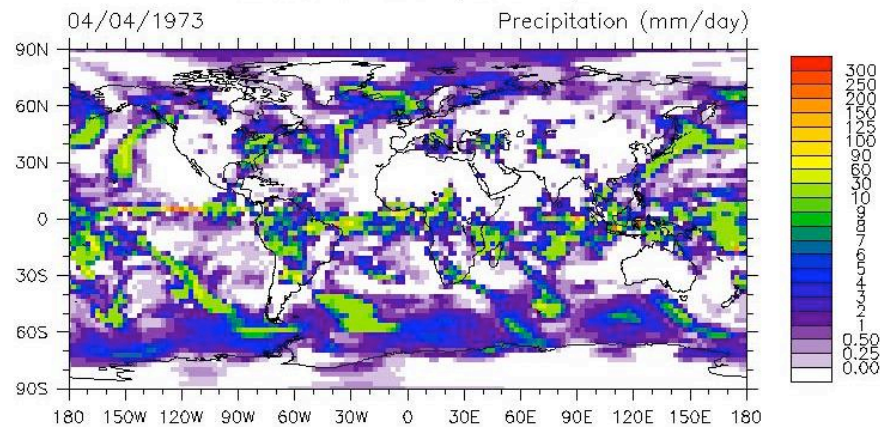
- 1. Precipitation in Ensemble forecasting**
- 2. Precipitation for hurricane characterization**

Usefulness of HQ precipitation estimates in ensemble forecasting

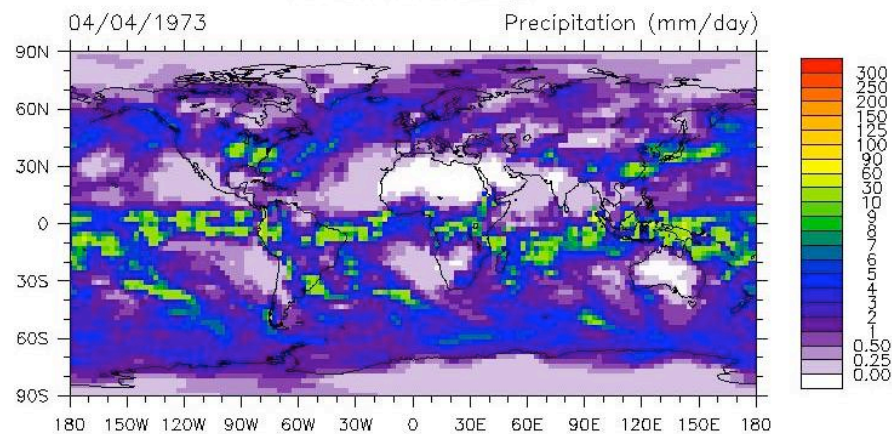


Tapiador, F.J., Gallardo, C., 2006.
 Entropy-Based Member Selection in a GCM Ensemble Forecasting.
Geophysical Research Letters, vol 33, L02804.

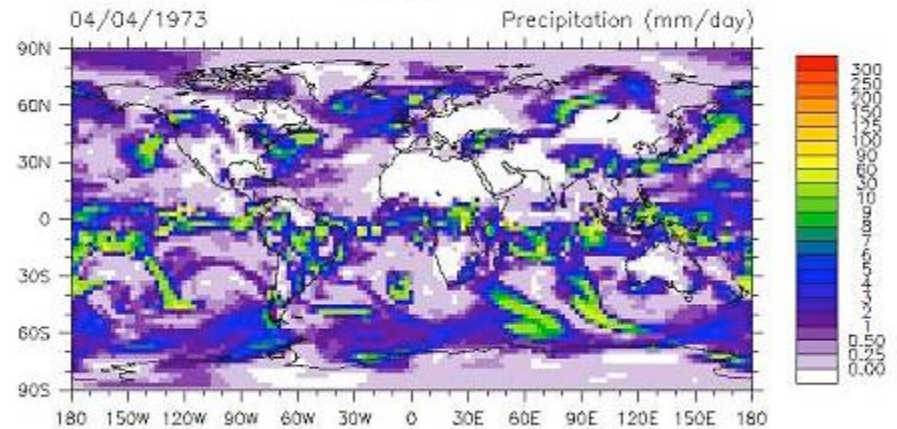
Validation Data (ERA-40)

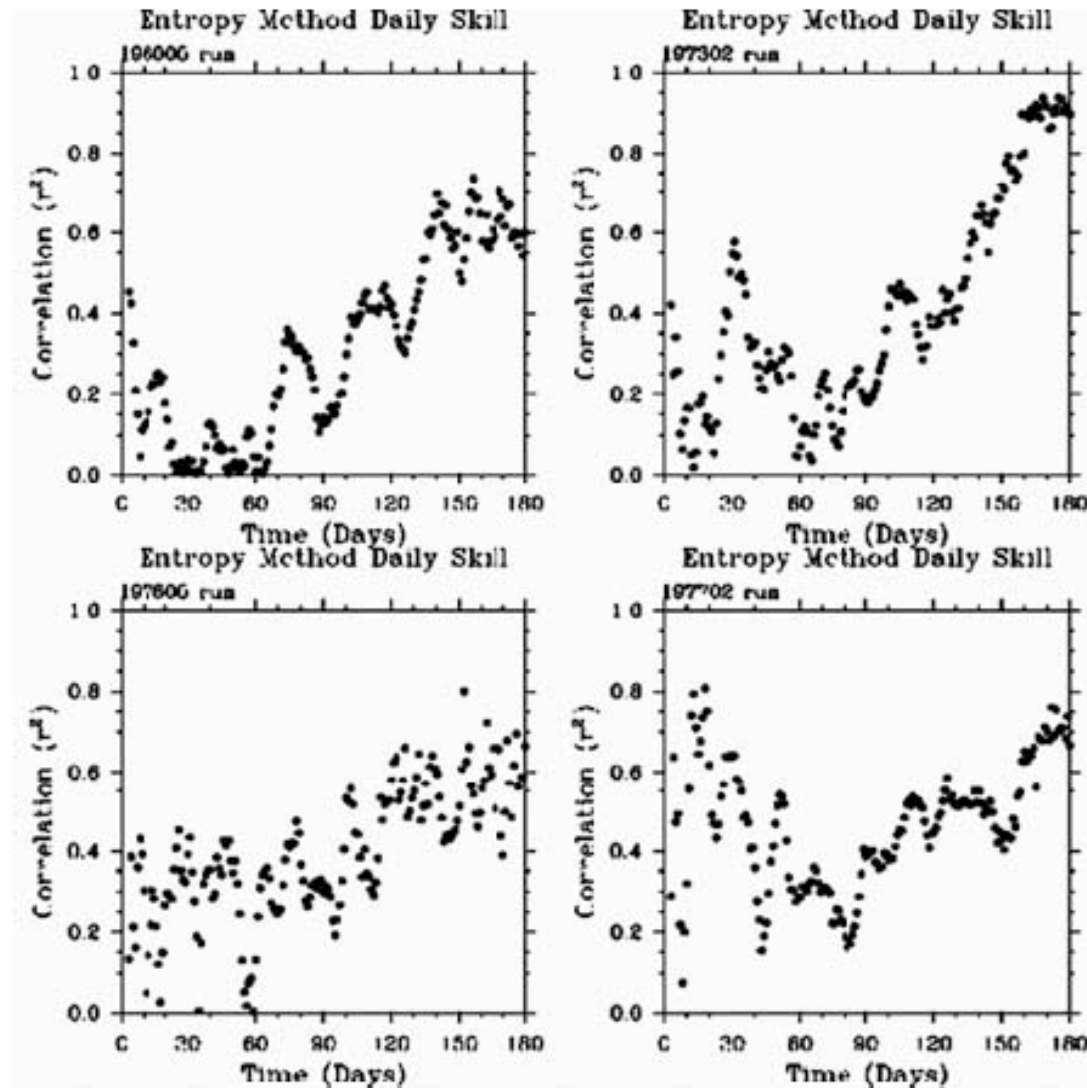


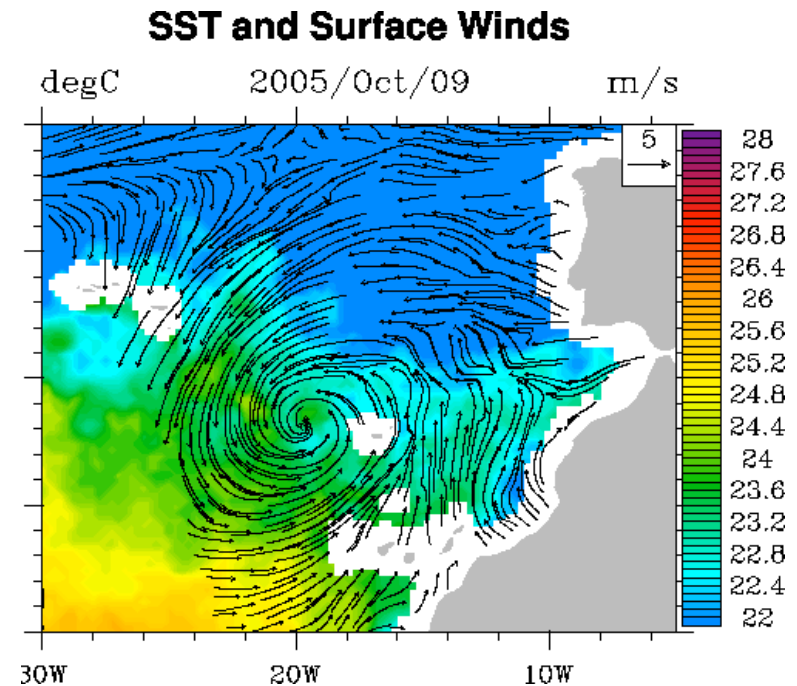
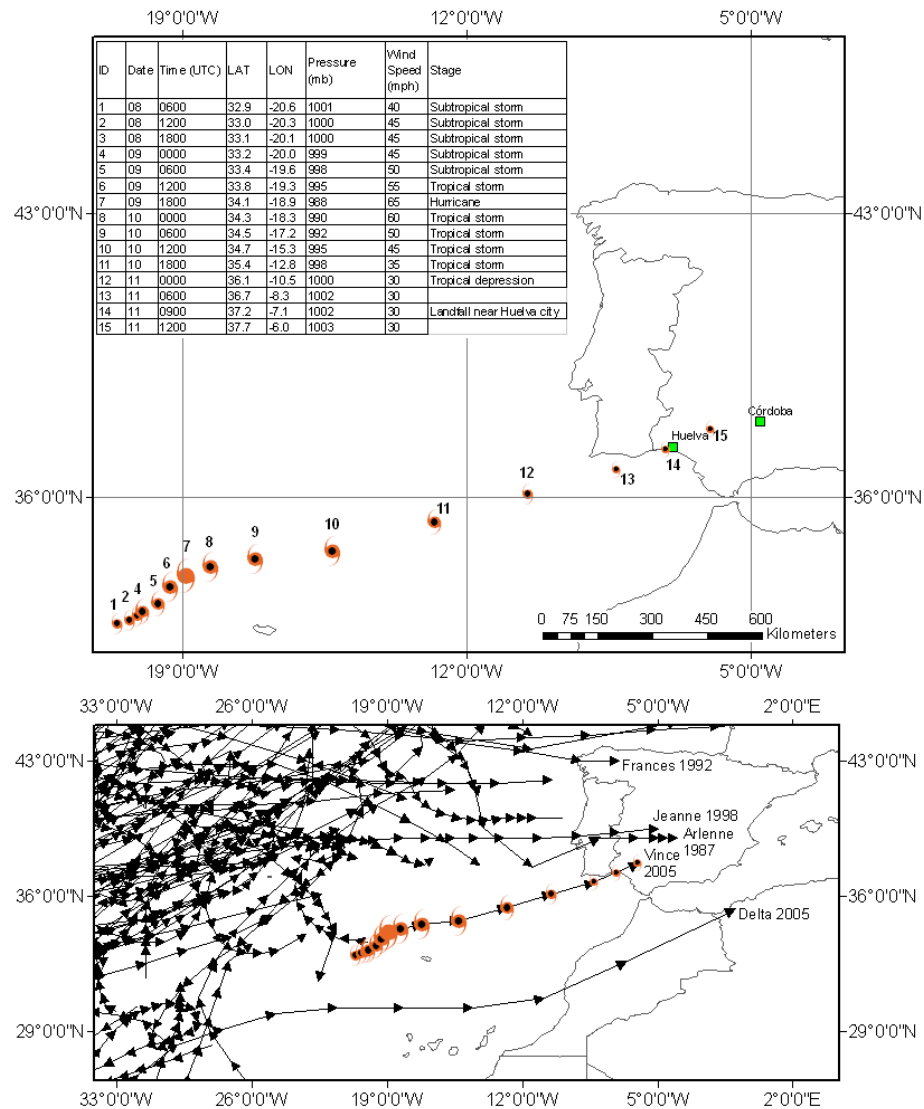
Ensemble Average



Member 5



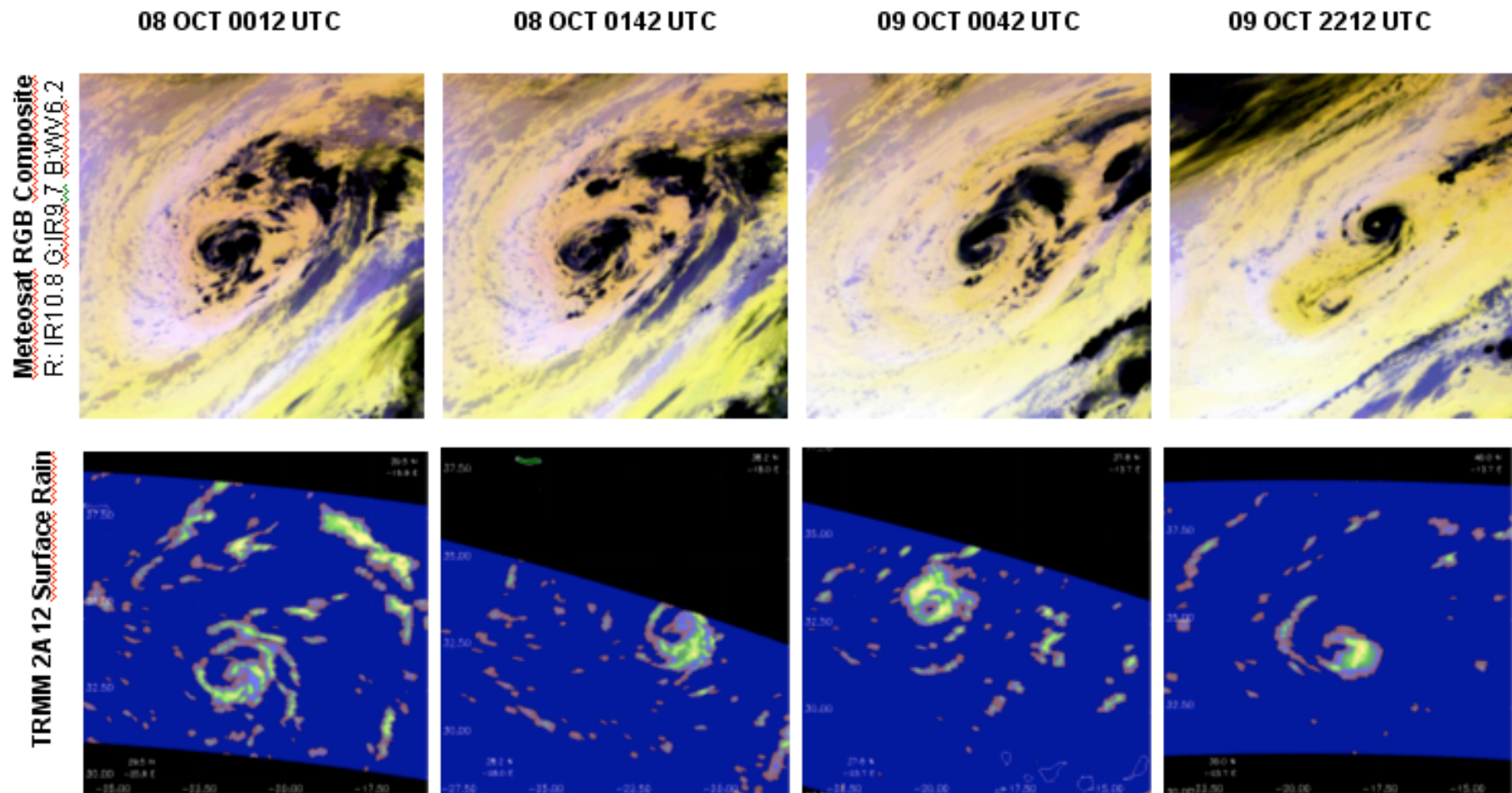


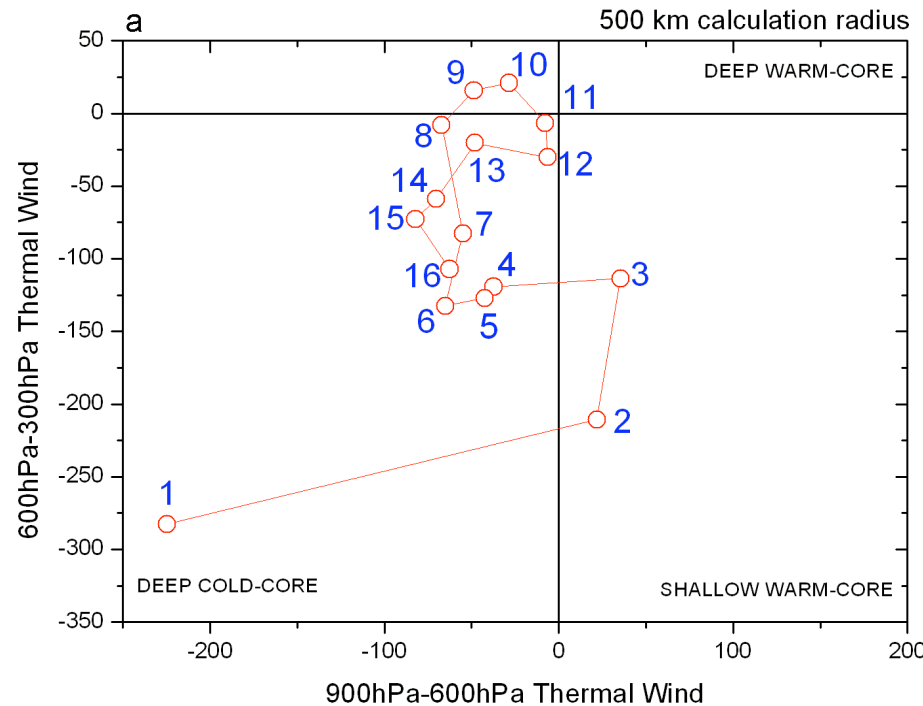


Tapiador et al. (2007) *A multisource analysis of hurricane Vince* (to appear)

Hurricane Vince 2005

IR and PMW for Hurricane phase-space characterization





Hart's phase-space plot

Choosing a radius
based upon vorticity
(or rainfall fields)

Future plans

- Continuing GPM-related activities at UCLM, UPC, and the CLM regional and national meteorological centers
- Satellite algorithms development, validation and integration for Spain: RT approach
- Use of precip estimates in climate and numerical modelling. Analyze the potential of improved rainfall estimates for assimilation and ensemble forecasting